MOTT MACDONALD

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

Attn:
Mr. Ray Yan – Independent Environmental Checker

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 December 2018 to February 2019 (Revision 1)

Our Reference
TC/GC/al/T355861/02/02/L135

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

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

23 January 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 December 2018 to February 2019 (Revision 1) 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. Xavier Lam / Mr. Ng Ka Po (By Email)

Ref.: HYDHZMBEEM00_0_7852L.20

24 January 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 December 2018 to February 2019 (Revision 1)

Reference is made to the previous ET Leader's certification letter (ET's ref.: "TC/GC/al/T355861/02/02/L124" dated 25 June 2019) and our previous verification letter (Our ref.: "HYDHZMBEEM00_0_7481L.19" dated 27 June 2019) in relation to the ET's submission of Quarterly EM&A Report for December 2018 to February 2019 (Revision 1) with inclusion of the corresponding establishment landscape monitoring report(s) prepared by other HZMB HKBCF contract(s) as requested by EPD in July 2019 (ET's ref.: "TC/GC/al/T355861/02/02/L135" dated 23 January 2020) and provided to us via e-mail on 24 January 2020.

We are pleased to inform you that we have no adverse comments on the captioned Quarterly EM&A Report for December 2018 to February 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

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MOTT MACDONALD

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

Quarterly EM&A Report for December 2018 to February 2019

January 2020

China State Construction Engineering (Hong Kong) Limited

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 15th Quarterly EM&A Report for the Contract which summarises findings of the EM&A works during the reporting period from 1 December 2018 to 28 February 2019 (the “reporting period”).

Landscape checklist for HyD Contract No. HY/2013/02 with respect to the reporting period is shown in **Appendix L**. Landscape checklist for HyD Contract Nos. HY/2013/01, HY/2013/03 and HY/2014/05 with respect to the reporting period were covered by other HKBCF contracts.

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.

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 report for landscape establishment for Contract No. HY/2013/02 with respect to the reporting period was covered by this Contract. The monitoring reports for landscape establishment for Contract Nos. HY/2013/01, HY/2013/03 and HY/2014/05 with respect to the reporting period were covered by other HKBCF contracts.

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

- 1-hour Total Suspended Particulates (TSP) monitoring: 26 sessions
- 24-hour TSP monitoring: 30 sessions
- Noise monitoring: 13 sessions
- Impact water quality monitoring: 8 sessions
- Impact dolphin monitoring: 6 sets of surveys conducted
- Joint Environmental site inspection: 13 sessions

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	-	-
Noise	$L_{eq\ (30\ min)}$	-	-
Water Quality	Suspended Solids (SS)	5	1
	Turbidity	-	-
	Dissolved Oxygen (DO)	-	-
Dolphin Monitoring	Quarterly analysis	-	1

The ET of this Contract conducted investigations into the exceedances of impact water quality monitoring and impact dolphin monitoring, and the findings are presented in this report.

Furthermore, impact 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

Water Quality

The water quality monitoring programme was resumed on 3 December 2018 to align with the Contractor's tentative schedule of marine works, and again temporarily suspended after completion of water quality monitoring on 14 December 2018 after the Contractor confirmed that no marine works were scheduled for the remainder of the reporting period.

Subsequently, the water quality monitoring programme was resumed on 2 January 2019 to align with the Contractor's tentative schedule of marine works and temporarily suspended at the completion of water quality monitoring on 4 January 2019 after the Contractor confirmed that marine works in the form of removal of the silt curtain was completed.

Landscape and Visual

The monitoring report for landscape establishment for Contract No. HY/2013/02 with respect to the reporting period was covered by this Contract. The monitoring reports for landscape establishment for Contract Nos. HY/2013/01, HY/2013/03 and HY/2014/05 with respect to the reporting period were covered by other HKBCF contracts.

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 15th Quarterly EM&A Report for the Contract which summarises findings of the EM&A works during the reporting period from 1 December 2018 to 28 February 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 (until 31 Dec 2018)	Raymond Dai	3465 2888	3465 2899
	Independent Environmental Checker (from 1 Jan 2019)	Ray Yan	3465 2836 / 5181 8401	3465 2899
	Environmental Site Supervisor (until 31 Dec 2018)	Ray Yan	5181 8165	3465 2899
	Environmental Site Supervisor (from 1 Jan 2019)	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

Party	Position	Name	Telephone	Fax
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
- Construction of parapets for bridge structures
- Construction of Retaining Wall RW16N and RW16S
- Construction of Bridge Deck D16 in-situ deck
- Construction of utilities cross-over frame under Bridge D9c
- Backfilling of retaining walls and formation of fill slopes and road embankment
- Drainage works and watermains laying
- Roadworks and road furniture
- Maintenance of temporary traffic arrangements (TTA) associated with the commissioning of HKBCF and TM-CLKL-SC
- Removal of silt curtain (marine-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 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 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(1)	Dragonair / CNAC (Group) Building
	AMS7B	3RS Site Offices
Noise	NMS2	Seaview Crescent
	NMS3C(2)	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) The Action and Limit Levels for schools will be applied for this alternative monitoring location.

The water quality monitoring works for HZMB HKBCF under the approved EM&A Manual for the reporting period are covered by this Contract. A total of twenty-one stations (nine Impact Stations, seven Sensitive Receiver Stations and five Control/Far Field Stations) are covered by the current EM&A programme.

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

Table 2.2: Impact Water Quality Monitoring Stations

Station	Description	East	North
IS5	Impact Station (Close to HKBCF construction site)	811579	817106
IS(Mf)6	Impact Station (Close to HKBCF construction site)	812101	817873

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

The dolphin monitoring works for the Contract are covered by Contract No. HY/2011/03 “Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road (HZMB HKLR) – Section between Scenic Hill and HKBCF” with the reporting of reporting results presented by the ET of Contract No. HY/2013/04. The dolphin monitoring should adopt line-transect vessel survey method. The survey follows pre-set and fixed transect lines in the two areas defined by AFCD as: Northeast Lantau survey area; and Northwest Lantau survey area.

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

Transect	HK Grid System		Long Lat in WGS84	
	X	Y	Long	Lat
1#	804671	815456	113.870287	22.277678
	804671	831404	113.869975	22.421696
2#^	805476	820800	113.877995	22.325951
	805476	826654	113.877882	22.378815
3^	806464	821150	114.030267	22.196697
	806464	822911	114.047344	22.196712
4^	807518	821500	114.033651	22.206219
	807518	829230	114.108618	22.206267
5^	808504	821850	114.037037	22.215126
	808504	828602	114.102523	22.215169
6^	809490	822150	114.039938	22.224033
	809490	825352	114.070995	22.224056
7#^	810499	822000	114.038474	22.233143

Transect	HK Grid System		Long Lat in WGS84	
	810499	824613	114.063820	22.233163
8#	811508	821123	113.936539	22.328966
	811508	824254	113.936486	22.357241
9#	812516	821303	113.946320	22.330606
	812516	824254	113.946279	22.357255
10*	813525	820827	113.956112	22.326321
	813525	824657	113.956066	22.360908
11#	814556	818853	113.966155	22.304858
	814556	820992	113.966125	22.327820
12	815542	818807	113.975726	22.308109
	815542	824882	113.975647	22.362962
13	816506	819480	113.985072	22.314192
	816506	824859	113.985005	22.362771
14	817537	820220	113.995070	22.320883
	817537	824613	113.995018	22.360556
15	818568	820735	114.005071	22.325550
	818568	824433	114.005030	22.358947
16	819532	821420	114.014420	22.331747
	819532	824209	114.014390	22.356933
17	820451	822125	114.023333	22.338117
	820451	823671	114.023317	22.352084
18	821504	822371	114.033556	22.340353
	821504	823761	114.033544	22.352903
19	822513	823268	114.043340	22.348458
	822513	824321	114.043331	22.357971
20	823477	823402	114.052695	22.349680
	823477	824613	114.052686	22.360610
21	805476	827081	113.877878	22.382668
	805476	830562	113.877811	22.414103
22	806464	824033	113.887520	22.355164
	806464	829598	113.887416	22.405423
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

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

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

Monitoring Station	Action Level, μg/m^3	Limit Level, μg/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, μg/m^3	Limit Level, μg/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.

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.

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^{-1}	Surface and Middle	Surface and Middle
(Surface, Middle & Bottom)	5.0	4.2 (except 5 mg/L for FCZ)
	Bottom	Bottom
	4.7	3.6

Parameters	Action	Limit
SS in mg L^{-1} (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.

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

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 December 2018, January 2019 and February 2019) prepared by Contract No. HY/2011/03.

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

3.2 Noise Monitoring Results

The monitoring results for NMS2 and NMS3C are reported in the monthly EM&A Reports (for December 2018, January 2019 and February 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.

The examination period of Ho Yu College was 10 – 22 January 2019, during which the Limit Level of 65 dB(A) was applied at NMS3C. The measured noise levels recorded at NMS3C on 15 January 2019 and 21 January 2019 were 68.4 dB(A) and 66.7 dB(A) respectively, which exceeded the noise level of 65 dB(A) during examination period and were higher than the baseline level of 66.3 dB(A). Therefore, baseline correction was carried out and the corrected noise levels which solely represent the noise level of construction works were 64.2 dB(A) and 56.1 dB(A) respectively, therefore there was no exceedance after correction. As such the Event and Action Plan was not triggered.

3.3 Water Quality Monitoring Results

The monitoring results for the twenty-one monitoring stations are reported in the monthly EM&A Report (for December 2018, January 2019 and February 2019) prepared for this Contract.

During the reporting period, a total of six exceedances of water quality (consisting of five Action Level exceedances and one Limit Level exceedance of suspended solids) 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.

Water quality exceedances recorded during the reporting period are summarised in **Table 3.1**.

Table 3.1: Summary of Water Quality Exceedances during Reporting Period

Date	Parameter (Units)	Station	Depth	Exceedance Recorded during Mid-ebb Tide	Exceedance Recorded during Mid-flood Tide
7 Dec 2018	SS	SR6	Depth Average	-	Action Level
10 Dec 2018	SS	SR6	Depth Average	Action Level	-
12 Dec 2018	SS	IS8	Depth Average	-	Limit Level
12 Dec 2018	SS	SR4(N)	Depth Average	-	Action Level
12 Dec 2018	SS	IS(Mf)9	Depth Average	-	Action Level
12 Dec 2018	SS	IS7	Depth Average	-	Action Level

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 impact dolphin monitoring at each survey area should be conducted twice per month.

The impact 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 impact 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 3.2**:

Table 3.2: Summary of Key Dolphin Survey Findings in the Reporting Period

Parameter	Findings
Number of Impact Surveys Completed^	6
Survey Distance Travelled under Favourable On-Effort Condition	801.7 km
Number of Sightings	12 sightings (10 sightings are “on effort” (which are all under favourable condition))
Number of dolphin individual sighted	38 individuals
Dolphin Encounter Rate#	NEL: 0.00 NWL: 2.4 ± 1.88
Dolphin Group Size	Average of NEL: 0 Average of NWL: 3.2 ± 1.80 (n = 12) Varied from 1-4 individuals (9 groups) to 5-7 individuals (3 groups)
Most frequent dolphin sighting area	NWL, near Lung Kwu Chau

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

\# Dolphin Encounter Rate = $\frac{\text{Sum of 1st, 2nd \& 3rd month's total sighting}}{\text{Sum of 1st, 2nd \& 3rd month's total effort}}$ X 100 km

(encounter rates are calculated using on effort sightings made under favourable conditions only.)

One (1) Limit Level exceedance of dolphin monitoring was recorded in the reporting period, as presented in **Table 3.3**. Event and Action Plan for Impact Dolphin Monitoring was triggered. For details of investigation, please refer to **Appendix K**.

Table 3.3: Summary of STG and ANI encounter rates in the Reporting Period

	NEL	NWL	Level Exceeded
STG*	0.0	2.4 ± 1.88	Limit
ANI**	0.0	8.0 ± 6.60	

Remarks: * Quarterly Average Encounter Rate of Number of Dolphin Sightings (STG) presents averaged encounter rates of the three monitored months in terms of groups per 100km per survey event.

$$\text{STG Encounter rate} = \frac{\begin{array}{c}\text{(Average of (total number of Individual/total effort) of 1st and 2nd completed survey\# of 1st month + Average of (total number of Individual/total effort) of 1st and 2nd completed survey\# of 2nd month +}\\ \text{Average of (total number of Individual/total effort) of 1st and 2nd completed survey\# of 3rd month)}\end{array}}{3} \times 100\text{km}$$

** Quarterly Average Encounter Rate of Total Number of Dolphins (ANI) presents averaged encounter rates of the three monitored months in terms of individuals per 100km per survey event.

$$\text{ANI Encounter rate} = \frac{\begin{array}{c}\text{(Average of (total number of Individual/total effort) of 1st and 2nd completed survey\# of 1st month+ Average of (total number of Individual/total effort) of 1st and 2nd completed survey\# of 2nd month +}\\ \text{Average of (total number of Individual/total effort) of 1st and 2nd completed survey\# of 3rd month)}\end{array}}{3} \times 100\text{ km}$$

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.

Implementation status of the Dolphin Watching Plan (DWP) was checked by ET. Training of marine mammal observer (MMO) was given to relevant staff and relevant records were kept properly. Silt curtains were provided at each box culvert for marine works areas in accordance with the approved Dolphin Watching Plan. The silt curtains were inspected regularly by ET and Contractor and the implementation was found to be in working order.

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 No. HY/2013/02 was conducted on 20 February 2019. The corresponding landscape monitoring report is presented in **Appendix L**.

Reporting of landscape establishment monitoring for Contract Nos. HY/2013/01, HY/2013/03 and HY/2014/05 with respect to the reporting period was covered by other HKBCF contracts.

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^3 to 126,000 m^3 (bulk volume). EPD has no comments on the request as in the letter dated 20 October 2016. The Secretary of Marine Fill Committee, CEDD approved the increasing quantity in the memo dated 10 November 2016.

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

As in the agreed SSTP for the inner area of the HKBCF Island, samples were taken from the seventeen batches of stockpiled marine sediments and from five boreholes each in one of the five sampling grids. After conducting chemical tests on samples, six batches of stockpiled samples under Contract No. HY/2013/03 and all eight batches of stockpiled samples under Contract No. HY/20013/04 are classified as Category L sediment. The Secretary of Marine Fill Committee of CEDD allocated disposal sites under memo dated 24 October 2016 and dated 22 November 2016 for disposal of a total of 9,500 m^3 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 3.4**):

Table 3.4: Summary of Marine Sediment disposed to Dumping Site via Contract No. HY/2013/03

Month/Year	Type of Sediment and Quantity Disposed (m^3)	
	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

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 December 2018, January 2019 and February 2019) prepared by Contract No. HY/2011/03.

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

During the reporting period, a total of six exceedances of water quality (consisting of five Action Level exceedances and one Limit Level exceedance of suspended solids) 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.

Furthermore, Limit Level exceedance of impact dolphin monitoring during December 2018 to February 2019 was recorded by the Environmental Team of this Contract.

Impact 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 clear the loose general refuse as soon as possible.
- The Contractor was reminded to provide water spraying on the haul road regularly to keep the road surface wet.
- The Contractor was reminded to provide the valid NRMM label for an excavator.
- The Contractor was reminded to clear the stagnant water as soon as possible.
- The Contractor was reminded to provide suitable bund or drip tray for chemical containers.
- The Contractor was reminded to provide dust mitigation measures for accumulated C&D material stockpiles.
- The Contractor was reminded to remove the oil stain and general refuse.

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 15th Quarterly EM&A Report for the Contract which summarises findings of the EM&A works during the reporting period from 1 December 2018 to 28 February 2019 (the "reporting period").

Breaches of Action and Limit Levels

Air Quality

There was no Action and Limit Level exceedance of 1-hr TSP level and 24-hr TSP level recorded at stations AMS2, AMS3C and AMS7B by the Environmental Team of this Contract during 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 December 2018, January 2019 and February 2019) prepared by Contract No. HY/2011/03.

Noise

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, a total of six exceedances of water quality (consisting of five Action Level exceedances and one Limit Level exceedance of suspended solids) 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.

Chinese White Dolphin

Limit Level exceedance of impact dolphin monitoring was recorded by the Environmental Team of this Contract for the period of December 2018 to February 2019.

Impact 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 5, 13, 17 and 27 December 2018, 2, 9, 16, 21 and 30 January 2019, and 8, 13, 20 and 25 February 2019. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site inspections.

Landscape Establishment Monitoring

Landscape checklist for HyD Contract No. HY/2013/02 with respect to the reporting period is shown in **Appendix L**. Landscape checklist for HyD Contract Nos. HY/2013/01, HY/2013/03 and HY/2014/05 with respect to the reporting period were covered by other HKBCF contracts.

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

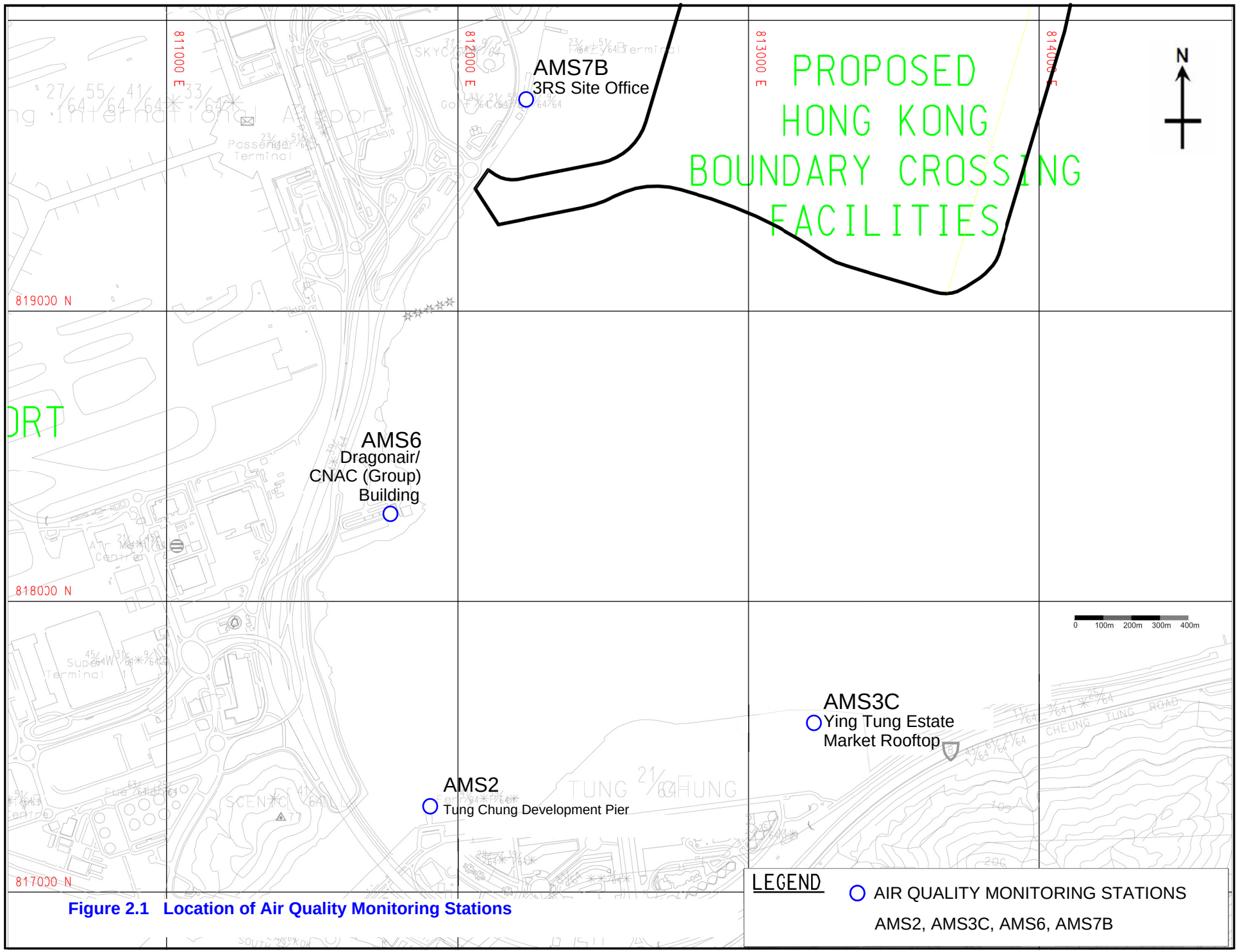


Figure 2.1 Location of Air Quality Monitoring Stations

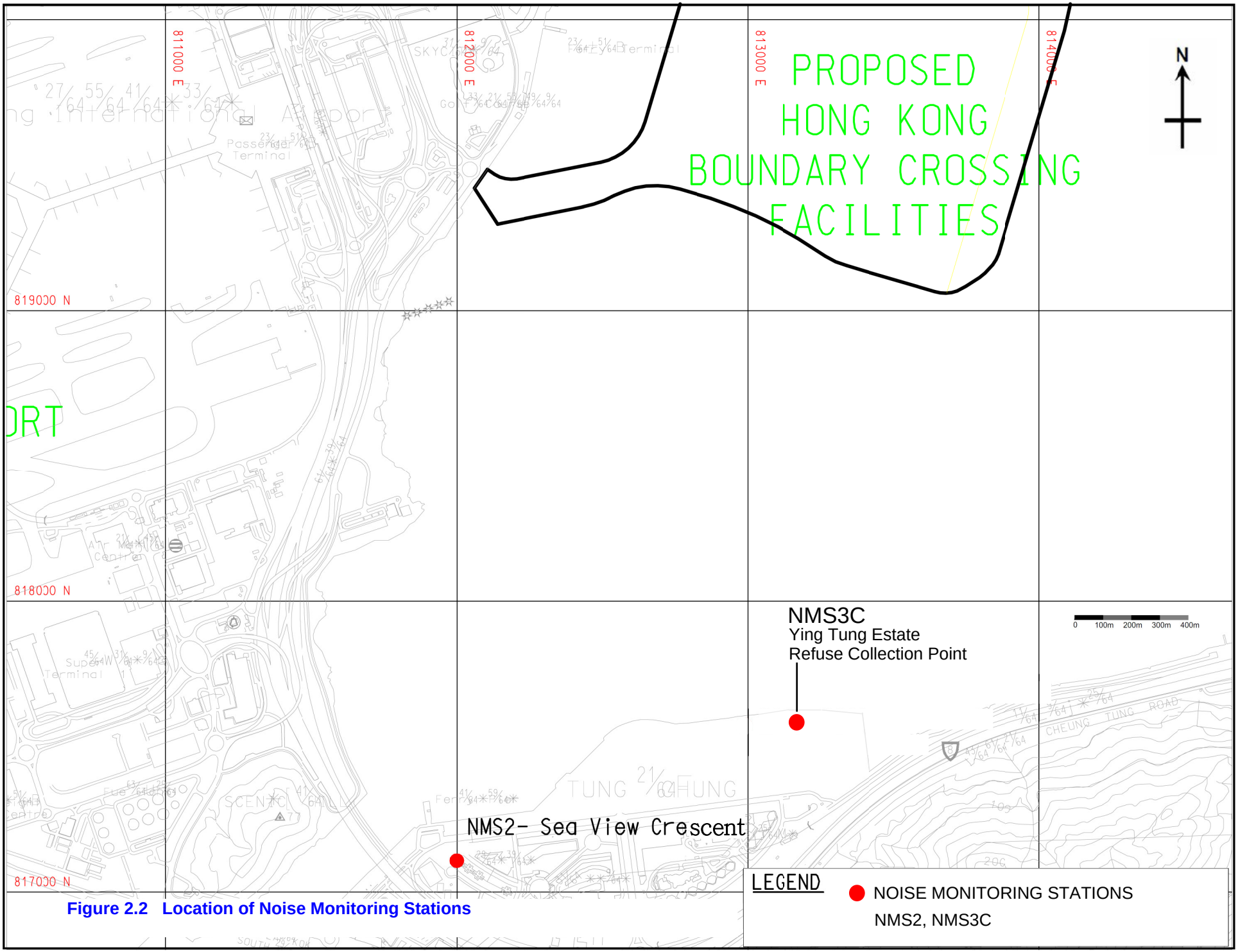


Figure 2.2 Location of Noise Monitoring Stations

Station	East	North
IS5	811579	817106
IS(Mf)6	812101	817873
IS7	812244	818777
IS8	814251	818412
IS(Mf)9	813273	818850
IS10(N)	812942	820881
IS(Mf)11	813562	820716
IS(Mf)16	814328	819497
IS17	814539	820391
SR3(N)	810689	816591
SR4(N)	814705	817859
SR5(N)	812569	821475
SR6	805837	821818
SR7	814293	821431
SR10A(N)	823644	823484
SR10B(N2)	823689	823159
CS(Mf)3(N)	808814	822355
CS(Mf)5	817990	821129
CS4	810025	824004
CS6	817028	823992
CSA	818103	823064

FIGURE 2.3 – LOCATION OF WATER QUALITY MONITORING STATIONS

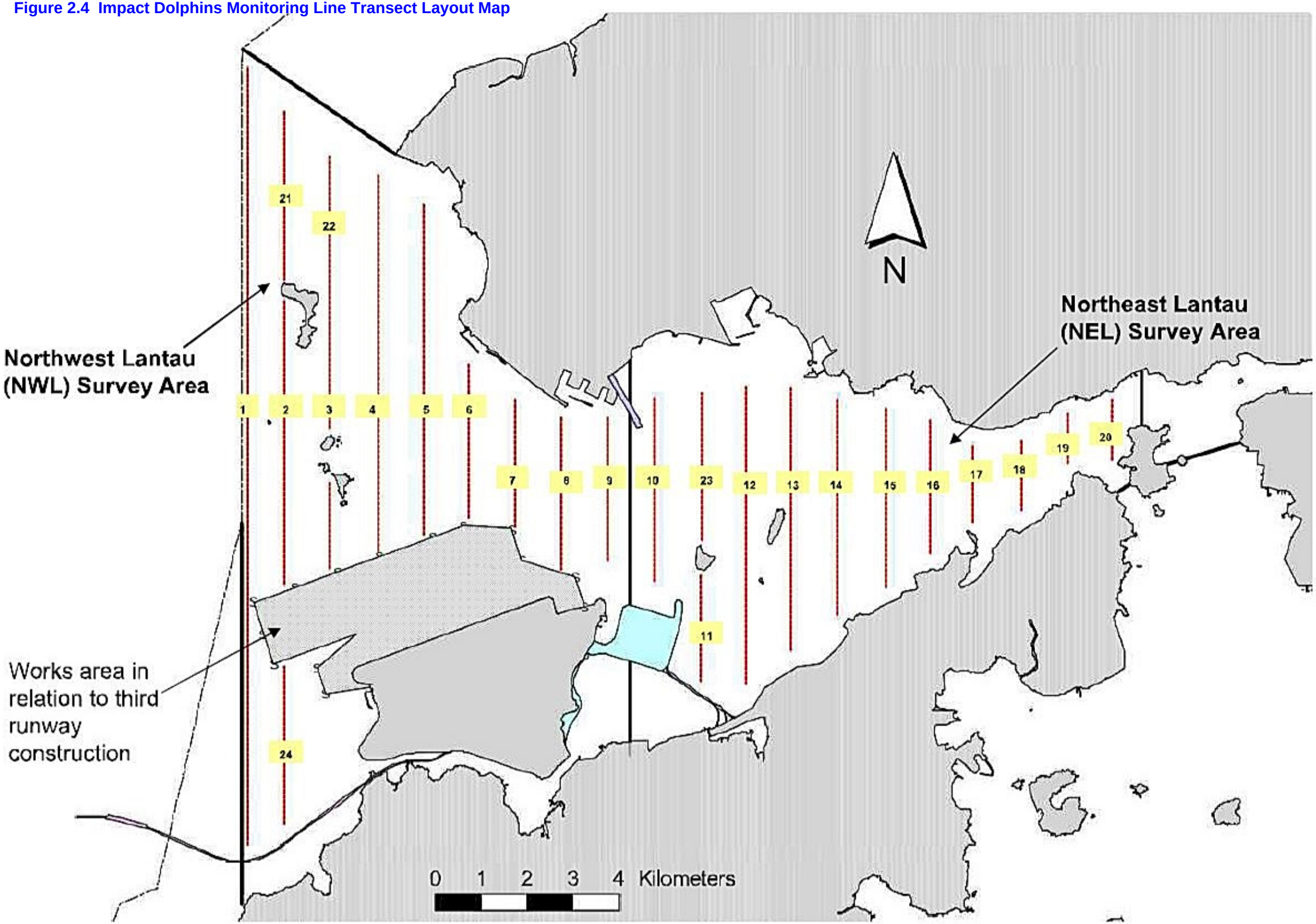
LEGEND

IS — IMPACT STATIONS

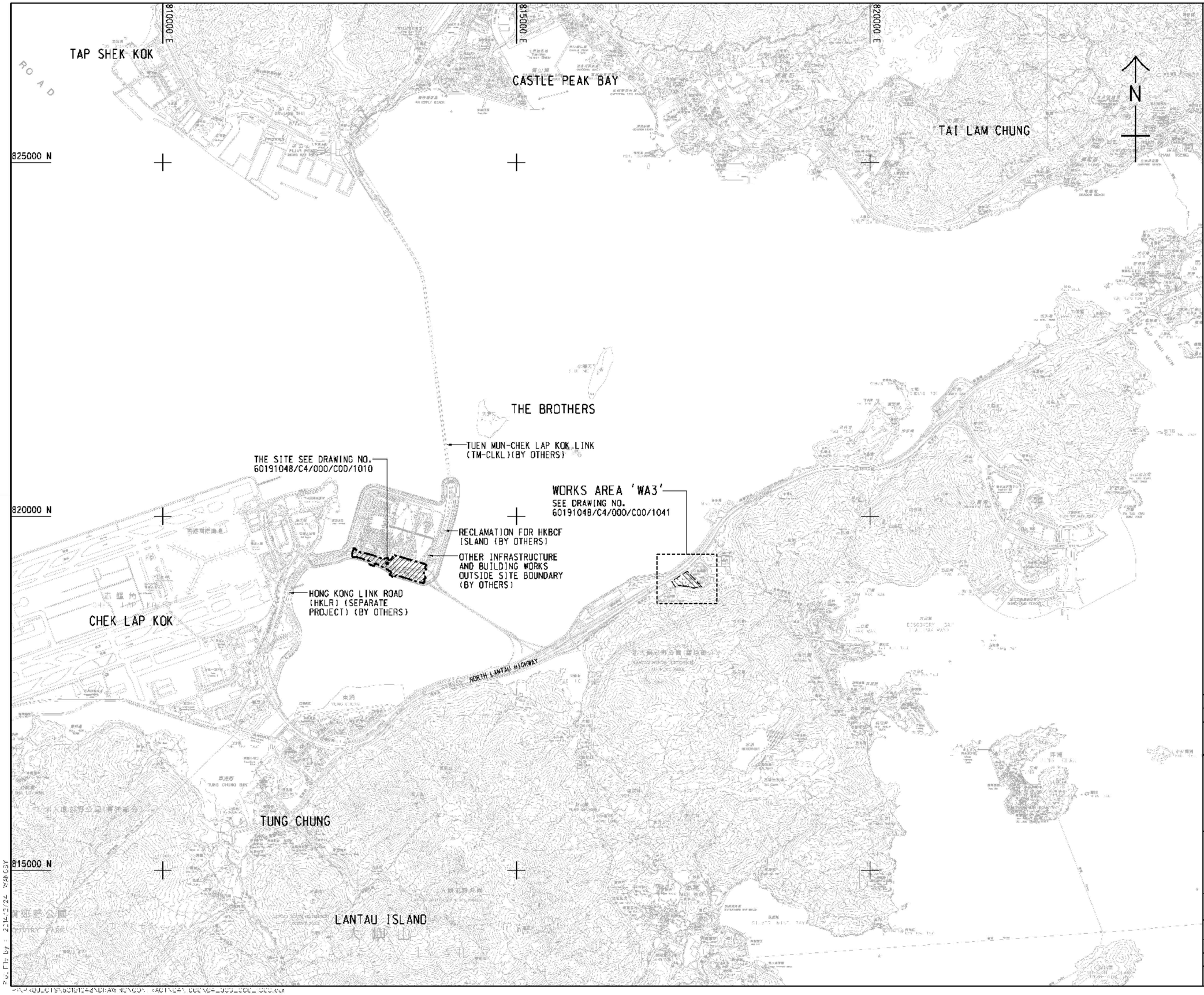
CS — CONTROL / FAR FIELD STATIONS

SR — SENSITIVE RECEIVERS STATIONS

Figure 2.4 Impact Dolphins Monitoring Line Transect Layout Map



Appendix A. Location of Works Areas



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:

SITE BOUNDARY

WORKS AREA

-	TENDER DRAWING	BWCW	SCI	FEB.14
REV.	DESCRIPTION	O.S. CHECKED	P.S. APPROVED	DATE

路政署
HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處
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)

SITE LOCATION PLAN

AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas

DRG.NO. 圖紙編號 60191048/C4/000/C00/1000

DESIGNED BY 設計 BWCW	CONTRACT NO. 合約編號 HY/2013/04	P. DIR. APPROVED 署長 TKH
DRAWN BY 繪圖 WSY	STATUS 狀況	
SCALE 比例 A1 1 : 25000		
DIMENSIONS ARE IN 尺寸單位 METRES	© COPYRIGHT RESERVED 版 權 所 有	

Plotted by : 2014/2/24 WSYCSY

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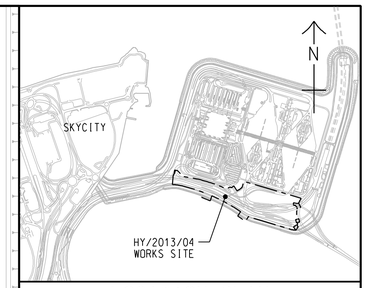
812800 E
813200 E
813600 E
820000 N
819600 N
819400 N

BRIDGE D1
BRIDGE D8
BOX CULVERT C
DEPRESSED ROAD DRAINAGE
PUMP HOUSE CUM SWITCH ROOM
BRIDGE D9a
BRIDGE D14a
BRIDGE D10
BRIDGE D14b
BRIDGE D9b
BRIDGE D11
BRIDGE D9c
BRIDGE D16N
BRIDGE D16S
BRIDGE D15
BRIDGE D13
BRIDGE D12a
BRIDGE D12b
BOX CULVERT D
M.J.

A



LOCATION PLAN
SCALE 1 : 25000

LEGEND:

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

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A	TENDER ADDENDUM NO. 3	BWCW SCI	MAY.14
–	TENDER DRAWING	BWCW SCI	FEB.14

D.C. P.D.

路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處 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)

GENERAL ARRANGEMENT

AECOM
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI
Aedas

DRG.NO. 圖紙編號 60191048/C4/000/C00/1002B

DESIGNED BY 設計	BWCW	CONTRACT NO. 合約編號	HY/2013/04
DRAWN BY 繪圖	WSY	P. Dir. APPROVED 批准人	TKH
SCALE 比例	A1 1 : 2000	STATUS 階段	WORKING DRAWING
DIMENSIONS ARE IN 尺寸單位	METRES		

Plot File by : 2014/5/7 WANGSY

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SETTING OUT POINT

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301	817467.265	819162.683
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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
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A

817200 E

817400 E

817600 E

819200 N

819000 N

NORTH LANTAU HIGHWAY

CHEUNG TUNG ROAD

小濛灣污水處理廠
Siu Ho Wan Sewage Treatment Works

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2011/03

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2011/09

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2013/02

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2013/01

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2013/03

10m WIDE COMMON ACCESS TO BE MAINTAINED BY CONTRACT NO. HY/2010/02

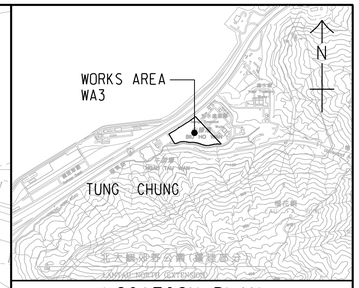
301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2010/02

10m WIDE COMMON ACCESS TO BE CONSTRUCTED AND INITIALLY MAINTAINED BY CONTRACT NO. HY/2013/01. UPON COMMENCEMENT OF CONTRACT NO. HY/2013/03. THE MAINTENANCE RESPONSIBILITY SHALL BE TRANSFERRED FROM CONTRACT NO. HY/2013/01 TO CONTRACT NO. HY/2013/03.

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2013/04

WORKS AREA OCCUPIED BY CONTRACT NO. HY/2014/05



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:

- 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 (A)

REV. 修訂	DESCRIPTION 內容摘要	D.E. P.E. CHECKED 查核	DATE 日期
B	WORKING DRAWING	BWCW SCI	APR.15
A	TENDER ADDENDUM NO. 2	BWCW SCI	APR.14
-	TENDER DRAWING	BWCW SCI	FEB.14

路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處 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. 圖紙編號 60191048/C4/000/C00/1041B

DESIGNED BY 設計 BWCW	CONTRACT NO. 合約編號 HY/2013/04	P. Dir. APPROVED 負責人 TKH
DRAWN BY 繪圖 WSY	STATUS 階段 **WORKING DRAWING**	
SCALE 比例 A1 1 : 1000		
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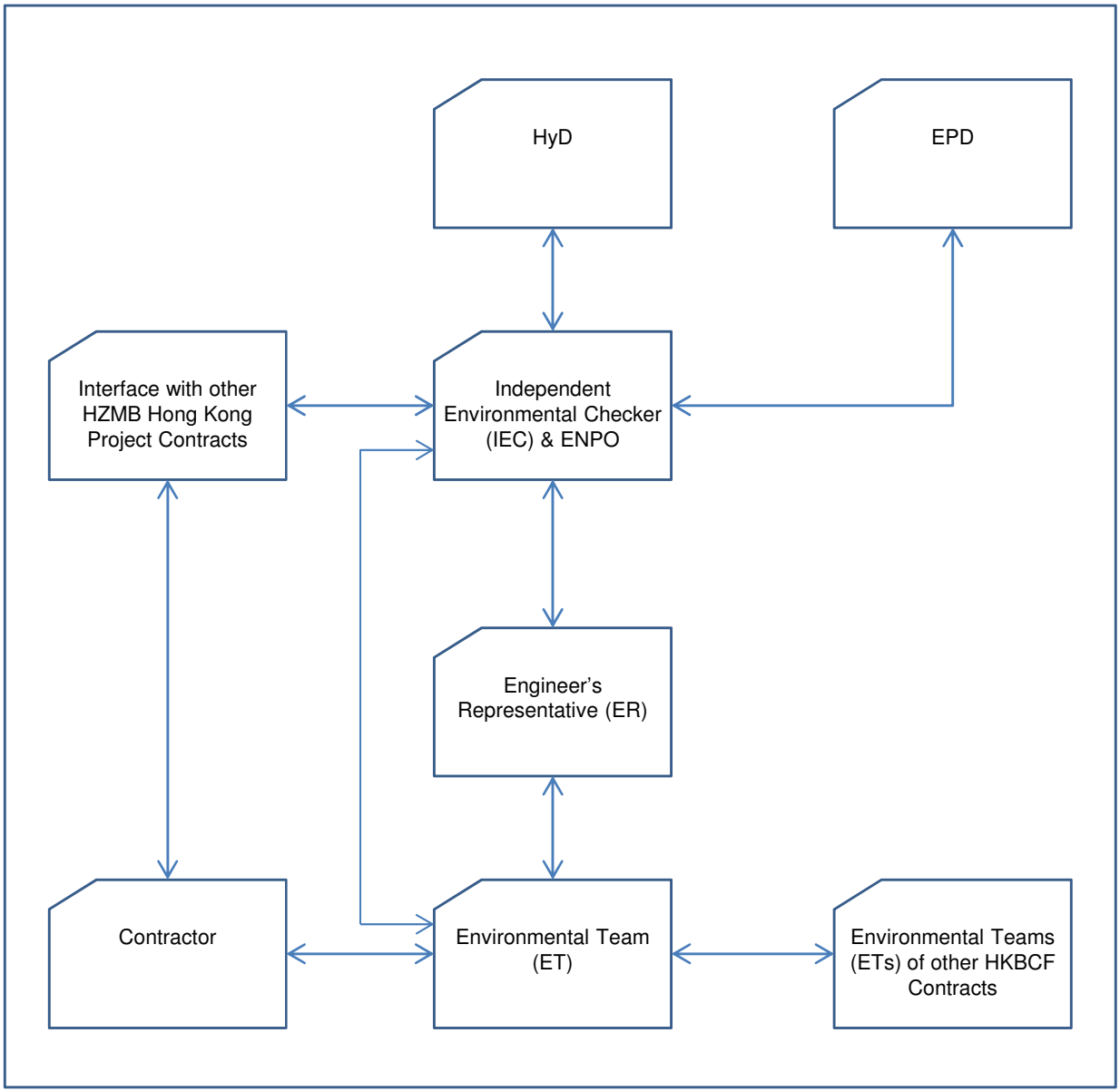
Appendix B. Project Organization for Environmental Works

Project Organisation for Environmental Works



Appendix C. Construction Programme

HY/2013/04 - Hong Kong Boundary Crossing Facilities Infrastructure Works Stage II (Southern Portion)

Activity ID	Activity Name	Milestone
Essential Works Updates - Tier 1 - 26 C		
Contract Key Dates		
CON.KD.0005	Letter of Acceptance (LOA)	Letter of Acceptance (LOA)
CON.KD.0010	Commencement Date	Commencement Date
CON.KD.0020	Completion of the whole of the Works (1520)	11-May-19, Completion of the whole of the Works (1520)
Possession Dates		
CON.PD.1010	Site Possession of Portion A1 (61) - 8	Site Possession of Portion A1 (61) - 8
CON.PD.1020	Site Possession of Portion A2 (61)	Site Possession of Portion A2 (61)
CON.PD.1050	Site Possession of Portion A5 (61)	Site Possession of Portion A5 (61)
CON.PD.1060	Site Possession of Portion A6 (61)	Site Possession of Portion A6 (61)
CON.PD.1070	Site Possession of Portion B1-5 (92)	Site Possession of Portion B1-5 (92)
CON.PD.1080	Site Possession of Portion B2 (123)	Site Possession of Portion B2 (123)
CON.PD.1130	Site Possession of Portion B5 (123)	Site Possession of Portion B5 (123)
CON.PD.1140	Site Possession of Portion C1 (184)	06-Oct-16 Site Possession of Portion C1 (184)
CON.PD.1150	Site Possession of Portion C2 (184)	Site Possession of Portion C2 (184)
CON.PD.1160	Site Possession of Portion D1 (183)	Site Possession of Portion D1 (183)
CON.PD.1180	Site Possession of Portion D3 (183)	Site Possession of Portion D3 (183)
CON.PD.1190	Site Possession of Portion A1 (61) - 2	Site Possession of Portion A1 (61) - 2
CON.PD.1200	Site Possession of Portion A1 (61) - 5	Site Possession of Portion A1 (61) - 5
CON.PD.1210	Site Possession of Portion A1 (61) - 1	Site Possession of Portion A1 (61) - 1
CON.PD.1220	Site Possession of Portion C1 -1 (184)	Site Possession of Portion C1 -1 (184)
CON.PD.1230	Site Possession of Portion C1 -2 (184)	Site Possession of Portion C1 -2 (184)
CON.PD.1240	Site Possession of Portion B1 -1 (92)	Site Possession of Portion B1 -1 (92)
CON.PD.1250	Site Possession of Portion B1 -2 (92)	Site Possession of Portion B1 -2 (92)
CON.PD.1260	Site Possession of Portion A1 (61) - 7	Site Possession of Portion A1 (61) - 7
CON.PD.1270	Site Possession of Portion B1-3 (92)	Site Possession of Portion B1-3 (92)
CON.PD.1280	Site Possession of Portion B1-4 (92)	Site Possession of Portion B1-4 (92)
CON.PD.1290	Site Possession of Portion C1 -3 (184)	Site Possession of Portion C1 -3 (184)
Site Access Dates		
CON.PD.1030	Site Access of Portion A3 (476)	06-Oct-16 Site Access of Portion A3 (476)
CON.PD.1040	Site Access of Portion A4 (627)	29-Nov-16 Site Access of Portion A4 (627)
CON.PD.1090	Site Access of Portion B3 (476)	06-Oct-16 Site Access of Portion B3 (476)
CON.PD.1100	Site Access of Portion B4 (627)	29-Nov-16 Site Access of Portion B4 (627)
CON.PD.1170	Site Access of Portion D2 (488)	06-Oct-16 Site Access of Portion D2 (488)
Contractual Key Dates - Stage / Section (		
CON.FOT.KD01	KD01 - Achievement of Stage 1A (525)	06-Oct-16, KD01 - Achievement of Stage 1A (525)
CON.FOT.KD02	KD02 - Achievement of Stage 1B (650)	22-Dec-16, KD02 - Achievement of Stage 1B (650)
CON.FOT.KD03	KD03 - Achievement of Stage 2 (525)	06-Oct-16, KD03 - Achievement of Stage 2 (525)
CON.FOT.KD04	KD04 - Achievement of Stage 3 (465)	06-Oct-16, KD04 - Achievement of Stage 3 (465)
CON.FOT.KD05	KD05 - Achievement of Stage 4 (615)	17-Nov-16, KD05 - Achievement of Stage 4 (615)
CON.FOT.KD06	KD06 - Achievement of Stage 5 (615)	17-Nov-16, KD06 - Achievement of Stage 5 (615)
CON.FOT.KD07	KD07 - Achievement of Stage 6 (270)	06-Oct-16, KD07 - Achievement of Stage 6 (270)
CON.FOT.KD08	KD08 - Completion of Section I of the Works (795)	16-May-17, KD08 - Completion of Section I of the Works (795)
CON.FOT.KD09	KD09 - Completion of Section II of the Works (803)	24-May-17, KD09 - Completion of Section II of the Works (803)
CON.FOT.KD10	KD10 - Completion of Section III of the Works (803)	24-May-17, KD10 - Completion of Section III of the Works (803)
CON.FOT.KD11	KD11 - Completion of Section IV of the Works (565)	06-Oct-16, KD11 - Completion of Section IV of the Works (565)
CON.FOT.KD12	KD12 - Completion of Section V of the Works (803)	24-May-17, KD12 - Completion of Section V of the Works (803)
CON.FOT.KD13	KD13 - Completion of Section VI of the Works (465)	06-Oct-16, KD13 - Completion of Section VI of the Works (465)
CON.FOT.KD14	KD14 - Completion of Section VII of the Works (1155)	11-May-18, KD14 - Completion of Section VII of the Works (1155)
CON.FOT.KD15	KD15 - Completion of Section VIIIA of the Works (795)	16-May-17, KD15 - Completion of Section VIIIA of the Works (795)
CON.FOT.KD16	KD16 - Completion of Section VIIIB of the Works (1155)	11-May-18, KD16 - Completion of Section VIIIB of the Works (1155)
CON.FOT.KD17	KD17 - Achievement of Stage 7 (718)	28-Feb-17, KD17 - Achievement of Stage 7 (718)
CON.FOT.KD17A	KD17A - Completion of Section VIIIC of the Works (795)	16-May-17, KD17A - Completion of Section VIIIC of the Works (795)
CON.FOT.KD18	KD18 - Completion of Section VIIID of the Works (1155)	11-May-18, KD18 - Completion of Section VIIID of the Works (1155)
CON.FOT.KD19	KD19 - Completion of Section IXA of the Works (1160)	16-May-18, KD19 - Completion of Section IXA of the Works (1160)
CON.FOT.KD20	KD20 - Completion of Section IXB of the Works (1520)	11-May-19, KD20 - Completion of Section IXB of the Works (1520)
Contractual Handover Dates to Employer		
CON.HD.1190	Handover of Portion A1 (KD8+28 days)	13-Jun-17, Handover of Portion A1 (KD8+28 days)
CON.HD.1200	Handover of Portion A2 (KD8+28 days)	13-Jun-17, Handover of Portion A2 (KD8+28 days)
CON.HD.1210	Handover of Portion A3 (KD9+28 days)	21-Jun-17, Handover of Portion A3 (KD9+28 days)
CON.HD.1220	Handover of Portion A4 (KD10+28 days)	21-Jun-17, Handover of Portion A4 (KD10+28 days)
CON.HD.1240	Handover of Portion A5 (KD13+0 days)	06-Oct-16, Handover of Portion A5 (KD13+0 days)

2015 2016 2017 2018 2019 2020 2021

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGINEERING (HONG KONG) LTD.

Current Milestone
Late Bar
Actual Work

HY/2013/04 - Detailed Works Programme

Detailed Works Programme (IWP) Rev. 04

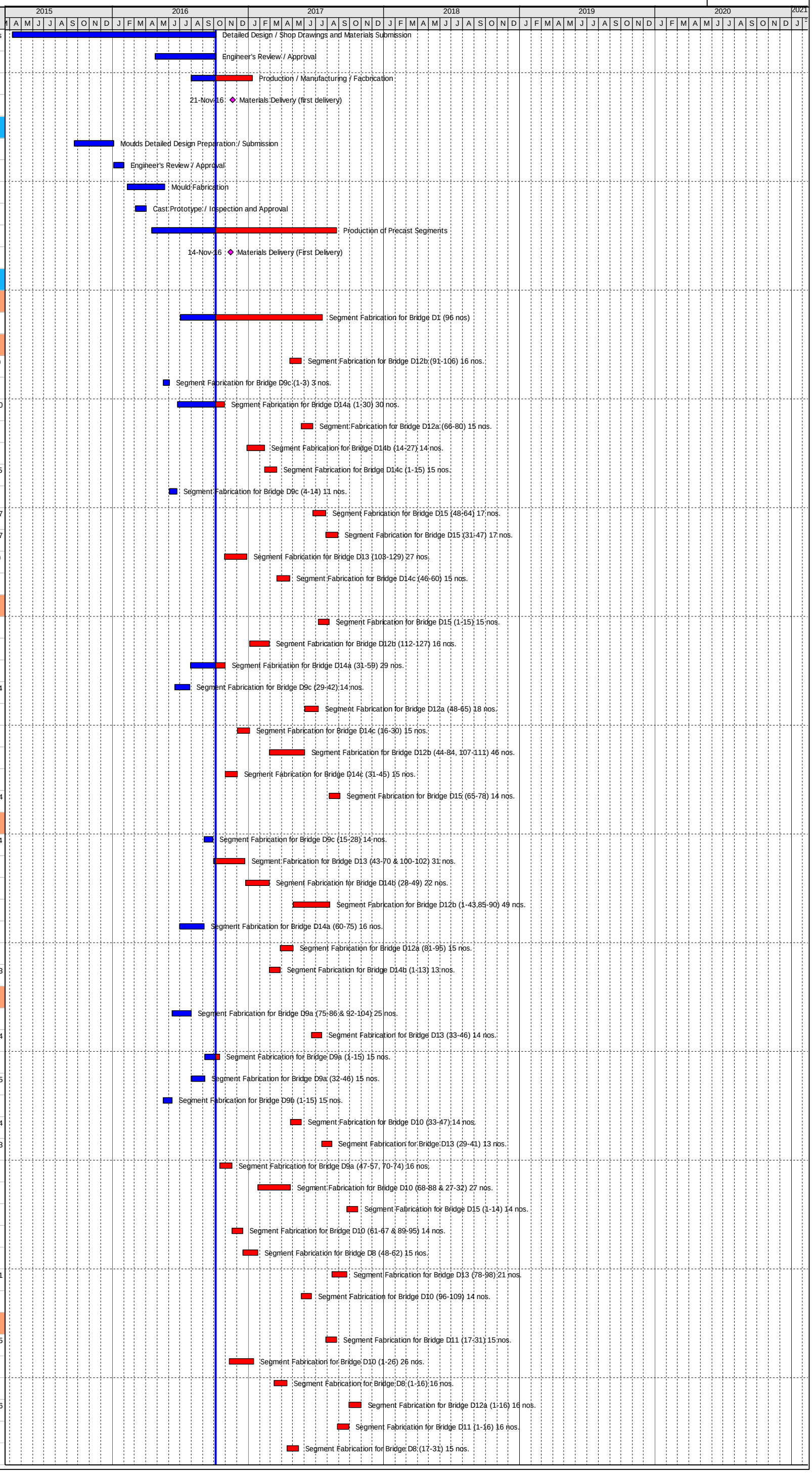
Date	Revision	Chec...	Approved
09-Sep-15	Detailed Works Programme ...	WN/WC	ET
17-Oct-15	Detailed Works Programme ...	WN/WC	ET
29-Oct-15	Detailed Works Programme ...	WN/WC	ET
25-Nov-15	Detailed Works Programme ...	WN/WC	ET

HY/2013/04 - Hong Kong Boundary Crossing Facilities Infrastructure Works Stage II (Southern Portion)

Activity ID	Activity Name	Gantt
CON.HD.1250	Handover of Portion A6 (KD14+28 days)	08-Jun-18, Handover of Portion A6 (KD14+28 days)
CON.HD.1260	Handover of Portion B1 (KD8+28 days)	13-Jun-17, Handover of Portion B1 (KD8+28 days)
CON.HD.1270	Handover of Portion B2 (KD8+28 days)	13-Jun-17, Handover of Portion B2 (KD8+28 days)
CON.HD.1280	Handover of Portion B3 (KD11+28 days)	02-Nov-16, Handover of Portion B3 (KD11+28 days)
CON.HD.1290	Handover of Portion B4 (KD12+28 days)	21-Jun-17, Handover of Portion B4 (KD12+28 days)
CON.HD.1300	Handover of Portion B5 (KD14+28days)	08-Jun-18, Handover of Portion B5 (KD14+28days)
CON.HD.1310	Handover of Portion C1 (KD8+28 days)	13-Jun-17, Handover of Portion C1 (KD8+28 days)
CON.HD.1320	Handover of Portion C2 (KD13+0 days)	06-Oct-16, Handover of Portion C2 (KD13+0 days)
CON.HD.1330	Handover of Portion D1 (KD8+28 days)	13-Jun-17, Handover of Portion D1 (KD8+28 days)
CON.HD.1340	Handover of Portion D2 (KD8+28 days)	13-Jun-17, Handover of Portion D2 (KD8+28 days)
CON.HD.1350	Handover of Portion D3 (KD8+28 days)	13-Jun-17, Handover of Portion D3 (KD8+28 days)
Contractor Planned Completion: Key Dat		
CON.SC.KD01	KD01 - Achievement of Stage 1A (525)	19-Jun-18, KD01 - Achievement of Stage 1A (525)
CON.SC.KD02	KD02 - Achievement of Stage 1B (650)	03-May-18, KD02 - Achievement of Stage 1B (650)
CON.SC.KD03	KD03 - Achievement of Stage 2 (525)	19-Jun-18, KD03 - Achievement of Stage 2 (525)
CON.SC.KD04	KD04 - Achievement of Stage 3 (465)	12-Jun-17, KD04 - Achievement of Stage 3 (465)
CON.SC.KD05	KD05 - Achievement of Stage 4 (615)	20-Aug-18, KD05 - Achievement of Stage 4 (615)
CON.SC.KD06	KD06 - Achievement of Stage 5 (615)	03-Aug-17, KD06 - Achievement of Stage 5 (615)
CON.SC.KD07	KD07 - Achievement of Stage 6 (270)	14-Nov-17, KD07 - Achievement of Stage 6 (270)
CON.SC.KD08	KD08 - Completion of Section I of the Works (795)	04-Jul-18, KD08 - Completion of Section I of the Works (795)
CON.SC.KD09	KD09 - Completion of Section II of the Works (803)	21-Aug-18, KD09 - Completion of Section II of the Works (803)
CON.SC.KD10	KD10 - Completion of Section III of the Works (803)	21-Aug-18, KD10 - Completion of Section III of the Works (803)
CON.SC.KD11	KD11 - Completion of Section IV of the Works (565)	10-Apr-18, KD11 - Completion of Section IV of the Works (565)
CON.SC.KD12	KD12 - Completion of Section V of the Works (803)	21-Aug-18, KD12 - Completion of Section V of the Works (803)
CON.SC.KD13	KD13 - Completion of Section VI of the Works (465)	29-Jun-17, KD13 - Completion of Section VI of the Works (465)
CON.SC.KD14	KD14 - Completion of Section VII of the Works (1155)	28-Aug-19, KD14 - Completion of Section VII of the Works (
CON.SC.KD15	KD15 - Completion of Section VIIIA of the Works (795)	03-Aug-18, KD15 - Completion of Section VIIIA of the Works (795)
CON.SC.KD16	KD16 - Completion of Section VIIIB of the Works (1155)	28-Aug-19, KD16 - Completion of Section VIIIB of the Work
CON.SC.KD17	KD17 - Achievement of Stage 7 (718)	03-Jul-18, KD17 - Achievement of Stage 7 (718)
CON.SC.KD17A	KD17A - Completion of Section VIIIC of the Works (795)	03-Aug-18, KD17A - Completion of Section VIIIC of the Works (795)
CON.SC.KD18	KD18 - Completion of Section VIIID of the Works (1155)	28-Aug-19, KD18 - Completion of Section VIIID of the Work
CON.SC.KD19	KD19 - Completion of Section IXA of the Works (1160)	03-Aug-19, KD19 - Completion of Section IXA of the Works (11
CON.SC.KD20	KD20 - Completion of Section IXB of the Works (1520)	27-Aug-20, KD20
Preliminaries and General Requiremer		
Insurance		
CON.PR.1010	Arrange and Secure Professional Indemnity Insurances and submit copy to Engineer	Arrange and Secure Professional Indemnity Insurances and submit copy to Engineer
Programme		
Initial Works Programme		
CON.PR.1020.10	Prepare & Submit Initial Works Programme (IWP)	Prepare & Submit Initial Works Programme (IWP)
CON.PR.1020.20	Engineer's Approval	Engineer's Approval
Provisional Programme for Piling Works		
CON.PR.1030.10	Prepare Detailed Piling Schedule (refer to IWP)	Prepare Detailed Piling Schedule (refer to IWP)
CON.PR.1030.20	Engineer's Approval	Engineer's Approval
3 Months Rolling Programme		
CON.PR.1040.10	Prepare 3 Months Rolling Programme	Prepare 3 Months Rolling Programme
CON.PR.1040.20	Engineer's Approval	Engineer's Approval
Detailed Works Programme		
CON.PR.1050.10	Prepare Detailed Works Programme (DWP)	Prepare Detailed Works Programme (DWP)
CON.PR.1050.20	Engineer's Approval	Engineer's Approval
Safety & Health		
CON.PR.1060.10	Draft Safety Plan	Draft Safety Plan
CON.PR.1060.20	Finalized Safety Plan	Finalized Safety Plan
Environmental Management Plan		
CON.PR.1080.10	Draft Envirionmental Management Plan	Draft Environmental Management Plan
CON.PR.1080.20	Finalized EMP	Finalized EMP
Sub-Contractor Management Plan		
CON.PR.1080.50	Draft Subcontractor Management Plan	Draft Subcontractor Management Plan
CON.PR.1080.60	Engineer's Approval	Engineer's Approval
Temporary Facilities		
CON.PR.0130	Site Possession / Access to Works Area WA3	Site Possession / Access to Works Area WA3
CON.PR.0140	Survey / Setting Out	Survey / Setting Out
CON.PR.0150.10	Site Formation / Site Clearing	Site Formation / Site Clearing
CON.PR.0160	Contractor's Site Office	Contractor's Site Office
CON.PR.0170	External Works - Paving, Drainage and Fencing	External Works - Paving, Drainage and Fencing
Contractors Design & Procurement		
Bridge Bearings		

HY/2013/04 - Hong Kong Boundary Crossing Facilities Infrastructure Works Stage II (Southern Portion)

Activity ID	Activity Name
PROC.MA.1610	Detailed Design / Shop Drawings and Materials Submission
PROC.MA.1615	Engineer's Review / Approval
PROC.MA.1650	Production / Manufacturing / Facbrication
PROC.MA.1670	Materials Delivery (first delivery)
Precast Concrete - Segments	
PROC.MA.1760	Moulds Detailed Design Preparation / Submission
PROC.MA.1765	Engineer's Review / Approval
PROC.MA.1770	Mould Fabrication
PROC.MA.1780	Cast Prototype / Inspection and Approval
PROC.MA.2570	Production of Precast Segments
PROC.MA.2590	Materials Delivery (First Delivery)
Segment Fabrication and Post Pouring	
Segment Fabrication Type A	
Fab.A1.001	Segment Fabrication for Bridge D1 (96 nos)
Segment Fabrication Type C1	
Fab.TC1.0010	Segment Fabrication for Bridge D12b (91-106) 16 nos.
Fab.TC1.0020	Segment Fabrication for Bridge D9c (1-3) 3 nos.
Fab.TC1.0030	Segment Fabrication for Bridge D14a (1-30) 30 nos.
Fab.TC1.0040	Segment Fabrication for Bridge D12a (66-80) 15 nos.
Fab.TC1.0050	Segment Fabrication for Bridge D14b (14-27) 14 nos.
Fab.TC1.0060	Segment Fabrication for Bridge D14c (1-15) 15 nos.
Fab.TC1.0080	Segment Fabrication for Bridge D9c (4-14) 11 nos.
Fab.TC2.00060	Segment Fabrication for Bridge D15 (48-64) 17 nos.
Fab.TC3.0060	Segment Fabrication for Bridge D15 (31-47) 17 nos.
Fab.TC4.0030	Segment Fabrication for Bridge D13 (103-129) 27 nos.
Fab.TC4.0060	Segment Fabrication for Bridge D14c (46-60) 15 nos.
Segment Fabrication Type C2	
Fab.TC1.0070	Segment Fabrication for Bridge D15 (1-15) 15 nos.
Fab.TC2.00010	Segment Fabrication for Bridge D12b (112-127) 16 nos.
Fab.TC2.00020	Segment Fabrication for Bridge D14a (31-59) 29 nos.
Fab.TC2.00030	Segment Fabrication for Bridge D9c (29-42) 14 nos.
Fab.TC2.00040	Segment Fabrication for Bridge D12a (48-65) 18 nos.
Fab.TC2.00050	Segment Fabrication for Bridge D14c (16-30) 15 nos.
Fab.TC3.0010	Segment Fabrication for Bridge D12b (44-84, 107-111) 46 nos.
Fab.TC3.0050	Segment Fabrication for Bridge D14c (31-45) 15 nos.
Fab.TC4.0070	Segment Fabrication for Bridge D15 (65-78) 14 nos.
Segment Fabrication Type C3	
Fab.TC3.0020	Segment Fabrication for Bridge D9c (15-28) 14 nos.
Fab.TC3.0030	Segment Fabrication for Bridge D13 (43-70 & 100-102) 31 nos.
Fab.TC3.0040	Segment Fabrication for Bridge D14b (28-49) 22 nos.
Fab.TC4.0010	Segment Fabrication for Bridge D12b (1-43,85-90) 49 nos.
Fab.TC4.0020	Segment Fabrication for Bridge D14a (60-75) 16 nos.
Fab.TC4.0040	Segment Fabrication for Bridge D12a (81-95) 15 nos.
Fab.TC4.0050	Segment Fabrication for Bridge D14b (1-13) 13 nos.
Segment Fabrication Type D2	
Fab.T1.0020	Segment Fabrication for Bridge D9a (75-86 & 92-104) 25 nos.
Fab.T1.0040	Segment Fabrication for Bridge D13 (33-46) 14 nos.
Fab.T1.0050	Segment Fabrication for Bridge D9a (1-15) 15 nos.
Fab.T2.0010	Segment Fabrication for Bridge D9a (32-46) 15 nos.
Fab.T2.0030	Segment Fabrication for Bridge D9b (1-15) 15 nos.
Fab.T2.0040	Segment Fabrication for Bridge D10 (33-47) 14 nos.
Fab.T2.0050	Segment Fabrication for Bridge D13 (29-41) 13 nos.
Fab.T3.0030	Segment Fabrication for Bridge D9a (47-57, 70-74) 16 nos.
Fab.T3.0040	Segment Fabrication for Bridge D10 (68-88 & 27-32) 27 nos.
Fab.T3.0070	Segment Fabrication for Bridge D15 (1-14) 14 nos.
Fab.T4.0020	Segment Fabrication for Bridge D10 (61-67 & 89-95) 14 nos.
Fab.T4.0040	Segment Fabrication for Bridge D8 (48-62) 15 nos.
Fab.T4.0050	Segment Fabrication for Bridge D13 (78-98) 21 nos.
Fab.T4.0060	Segment Fabrication for Bridge D10 (96-109) 14 nos.
Segment Fabrication Type D3	
Fab.T1.0010	Segment Fabrication for Bridge D11 (17-31) 15 nos.
Fab.T1.0030	Segment Fabrication for Bridge D10 (1-26) 26 nos.
Fab.T1.0060	Segment Fabrication for Bridge D8 (1-16) 16 nos.
Fab.T1.0070	Segment Fabrication for Bridge D12a (1-16) 16 nos.
Fab.T2.0020	Segment Fabrication for Bridge D11 (1-16) 16 nos.
Fab.T2.0060	Segment Fabrication for Bridge D8 (17-31) 15 nos.

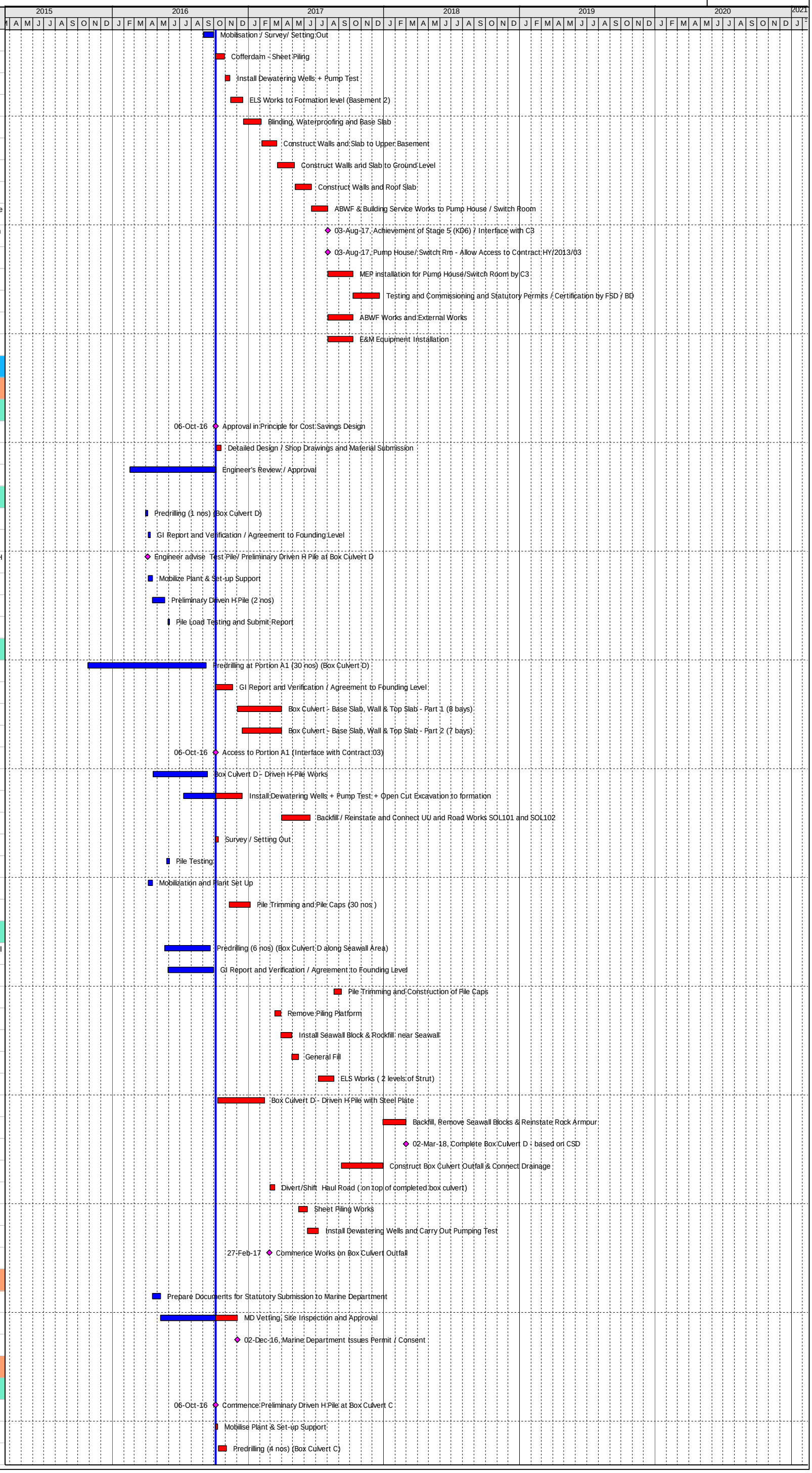


Activity ID	Activity Name
Fab.T2.0080	Segment Fabrication for Bridge D10 (47-60) 14 nos.
Fab.T3.0005	Segment Fabrication for Bridge D9a (16-31) 16 nos.
Fab.T3.0010	Segment Fabrication for Bridge D9b (38-44) 7 nos.
Fab.T3.0020	Segment Fabrication for Bridge D9b (16-30) 15 nos.
Fab.T3.0050	Segment Fabrication for Bridge D8 (32-47) 16 nos.
Fab.T3.0080	Segment Fabrication for Bridge D9b (31-37) 7 nos.
Fab.T4.0010	Segment Fabrication for Bridge D9a (58-69, 87-91) 17 nos
Fab.T4.0030	Segment Fabrication for Bridge D13 (15-28 & 71-77) 22 nos.
Pier Segment - Type C -1	
Fab.T3.00120	Pier Segment for Bridge D9c - 3 Nos
Fab.T3.00130	Pier Segment for Bridge D13 - 4 Nos
Fab.T3.00140	Pier Segment for Bridge D14b - 4 Nos
Fab.T3.00150	Pier Segment for Bridge D12a - 4 Nos
Fab.T3.00160	Pier Segment for Bridge D14c - 4 Nos
Fab.T3.00170	Pier Segment for Bridge D12b - 4 Nos
Fab.T3.00180	Pier Segment for Bridge D15 - 4 Nos
Fab.T3.00260	Pier Segment for Bridge D15 - 4 Nos
Fab.T3.0090	Pier Segment for Bridge D14a - 6 Nos
Pier Segment - Type D- 1	
Fab.T2.0070	Segment Fabrication for Bridge D12a (18-31) 14 nos.
Fab.T3.00100	Pier Segment for Bridge D9b - 4 Nos
Fab.T3.00190	Pier Segment for Bridge D9a - 5 Nos
Fab.T3.00200	Pier Segment for Bridge D11 - 3 Nos
Fab.T3.00210	Pier Segment for Bridge D10 - 5 Nos
Fab.T3.00220	Pier Segment for Bridge D8 - 5 Nos
Fab.T3.00230	Pier Segment for Bridge D13 - 6 Nos
Fab.T3.00240	Pier Segment for Bridge D12a - 4 Nos
Fab.T3.00250	Pier Segment for Bridge D15 - 1 Nos
Fab.T3.00280	Pier Segment for Bridge D10 - 5 Nos
Fab.T3.00290	Pier Segment for Bridge D9a - 5 Nos
Fab.T3.0060	Segment Fabrication for Bridge D12a (33-46) 14 nos.
E&M Works and Building Services for Pu	
PROC.SC.1285	Detailed Design and Material/ Equipment Submisison & Statutory Approval (FSD/EMSD)
PROC.SC.1287	Engineer's Review / Approval
PROC.SC.1290	Procurement and Manufacturing of Materials
PROC.SC.1300	Materials Delivery (first delivery)
PROC.SC.1310	Draft Operation and Maintenance (O&M) Manual
PROC.SC.1320	Engineer's Review on Draft O&M Manual
PROC.SC.1330	Draft Testing and Commissioning (T&C) Procedure
PROC.SC.1340	Final T&C Procedure
PROC.SC.1350	Engineer's Review on Draft T&C Procedure
PROC.SC.1360	Engineer's Approval on Final T&C Procedure
PROC.SC.2840	Final O&M Manual with as-fitted drawings
PROC.SC.2850	Engineer's Approval on Final O&M Manual with as-fitted drawings
Steel Structures for Sign Gantry / High M	
PROC.MA.1990	Detailed Design / Material Submission
PROC.MA.1995	Engineer's Review / Approval
PROC.MA.2010	Manufacture of Steel Structures
PROC.MA.2020	Material Delivery (first delivery)
Roads and Bridge Lighting	
PROC.MA.2840	Lighting Arrangement Detailed Design / Material Submission and Approval (within 12
PROC.MA.2845	Engineer's Review / Approval
PROC.MA.2850	Manufacture of Road and Bridge Lighting
PROC.MA.2860	Material Delivery (first delivery)
Irrigation System	
PROC.SC.1178	The Engineer confirm Landscape Works/ Irrigation Work (31 Dec 2015)
PROC.SC.1180	Detailed Design / Material Submission
PROC.SC.1185	Engineer's Review / Approval
PROC.SC.1190	Procurement and Shipment of Irrigation Materials/Equipment
Soft Landscaping	
PROC.SC.2760	Propose Nursery for Landscape Materials
PROC.SC.2780	Joint Inspection and Engineer's approval
PROC.SC.2790	Landscape Materials Growing
PROC.SC.2810	Materials Delivery (first delivery)
Construction / Installation	
Initial Works / Site Establishment & Mai	

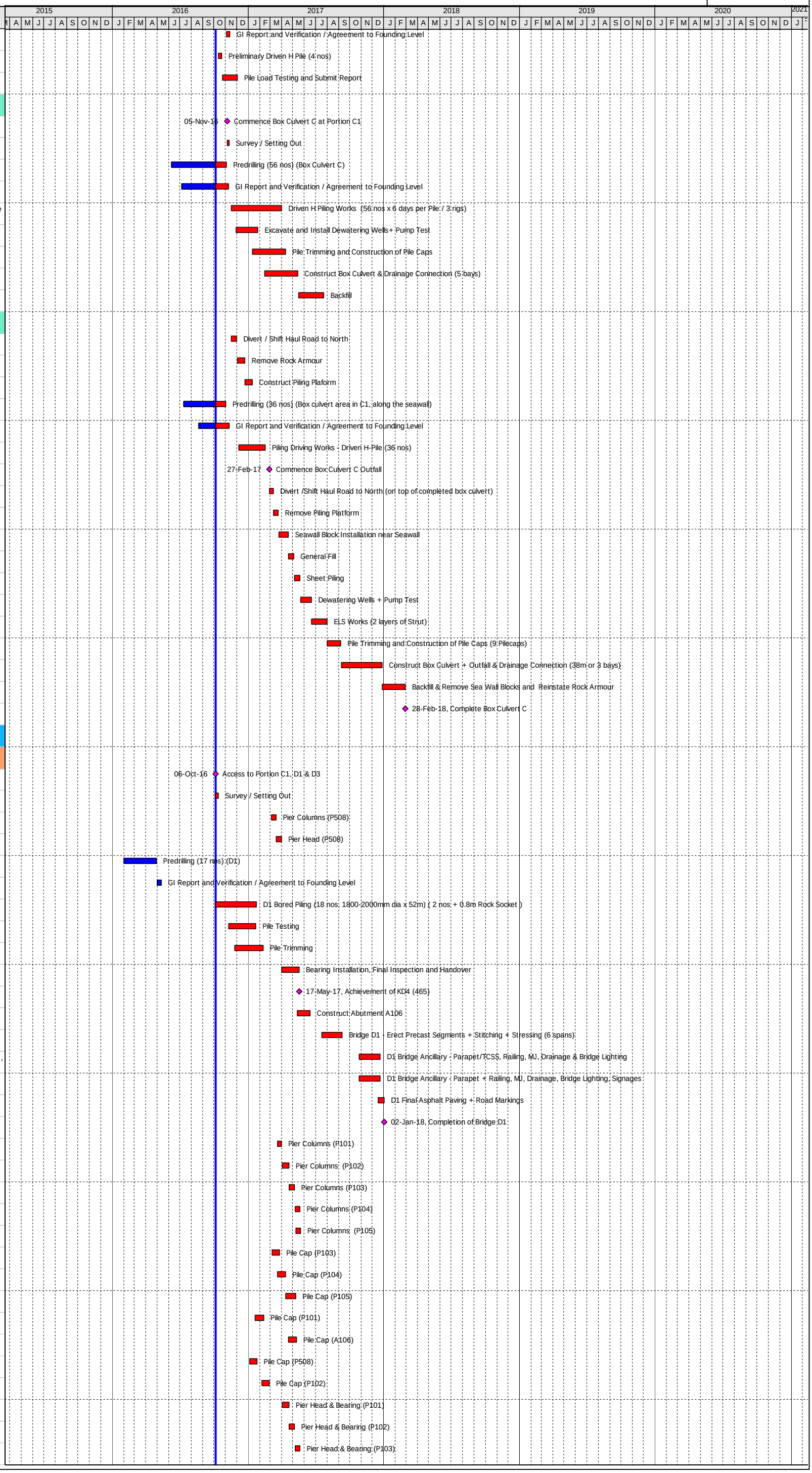
HY/2013/04 - Hong Kong Boundary Crossing Facilities Infrastructure Works Stage II (Southern Portion)

Activity ID	Activity Name
Mobilisation and Site Establlishment	
CONS.A1.0100	Site Possession / Access to Portion A1, A2, A5 & A6
CONS.A1.0110	Mobilisation, Site Clearing and Site Set-up
CONS.A1.0120	Install Temporary Facilities / Hygiene Facilities
Gates and Haul Road Construction (as per Dw	
CONS.A1.1010	Site Possession / Access to Portion A1
CONS.A1.1020	Survey/ Setting Out
CONS.A1.1030	Construct Gate 1 at Haul Road
CONS.B1.1010	Site Possession / Access to Portion B1
CONS.B1.1020	Mobilisation, Site Survey and Setting Out
CONS.B1.1030	Construct Gate 3 and Temporary Haul Road
CONS.B2.1010	Site Possession / Access to Portion B2 & B5
CONS.B2.1020	Site Survey / Setting out
CONS.B2.1030	Construct Temporary Haul Road
Preliminary Bored Pile with Additional Instrum	
CONS.A1.0180	Commence Preliminary Bored Pile at Abutment A1101
CONS.A1.0190	Mobilise Plant & Set-up Support
CONS.A1.0195.1	Predrilling to Preliminary Bored Pile (D11)
CONS.A1.0195.2	GI Report and Verification / Agreement to Founding Level
CONS.A1.0200	Preliminary Bored Piling with Additional Instrumentation at Abutment A1101 (1 no.
CONS.A1.0210	Pile Curing
CONS.A1.0220	Pile Load Testing & Submit Report
Replacement Preliminary Bored Pile and Load	
CONS.A1.0195.6	GI Report and Verification / Agreement to Founding Level
CONS.A1.0195.7	Engineer's Representative confirmed the replacement bored pile at Pier P908-P1
CONS.A1.0280	Commence Replacement Preliminary Bored Pile at Abutment A1004
CONS.A1.0290	Mobilise Plant & Set-up Support
CONS.A1.0300	Replacement Preliminary Bored Piling - Pier P908
CONS.A1.0310	Pile Curing
CONS.A1.0320	Pile Load Testing & Submit Report
Preliminary Bored Pile and Load Testing at Abu	
CONS.C1.0400	Commence Preliminary Bored Pile at Abutment A106
CONS.C1.0410	Mobilise Plant & Set-up Support
CONS.C1.0415.1	Predrilling to Preliminary Bored Pile (D1)
CONS.C1.0415.2	GI Report and Verification / Agreement to Founding Level
CONS.C1.0420	Preliminary Bored Piling - Abutment A106 (1 no. 2000mm dia x 52m)
CONS.C1.0430	Pile Curing
CONS.C1.0440	Pile Load Testing and Submit Report
Prelimnary Driven H Piles and Load Testing	
CONS.A1.4360	Test Pile approved, commence permanent driven h-pile
CONS.C1.0510	Engineer select Preliminary Test Pile (Driven H Pile)
CONS.C1.0520	Mobilise Plant & Set-up Support
CONS.C1.0530.1	Pre-drilling (2 nos) (Sign Gantry - Preliminary Pile)
CONS.C1.0530.2	GI Report and Verification / Agreement to Founding Level
CONS.C1.0540	Preliminary Driven H Pile (2 nos)
CONS.C1.0550	Pile Load Testing and Submit Report
Preliminary Pre-Bored H-Pile and Load Testing	
CONS.A1.0195.3	Predrilling to Preliminary Pre-Bored H-Pile - 1 no.
CONS.A1.0195.4	GI Report and Verification / Agreement to Founding Level
CONS.A1.0230	Engineer select Preliminary Test Pile (Pre-Bored H-Pile)
CONS.A1.0240	Mobilise Plant & Set-up Support
CONS.A1.0250	Preliminary Pre-Bored H-Piling - 1 no.
CONS.A1.0270	Pile Load Testing & Submit Report
Treatment for Bored Piling Excavated Materials	
CONS.EX.1010	Set-up Stockpile for Excavated Marine Mud
CONS.EX.1020	Pilot Test for Marine Mud Treatment
CONS.EX.1030	Solidification / Stabilisation / Approval Method
CONS.EX.1040	Set-up Treatment Facilities and Storage Yard
CONS.EX.1050	Full Scale Solidification / Stabilization Treatment and Verification Testing
CONS.EX.1060	Decommissioning of Treatment Facilities
Site Set Up at Portion C1	
CONS.C1.1010	Site Possession / Access to Portion C1 and C2
CONS.C1.1020	Site Possession / Access to Portion D1 and D3
CONS.C1.1030	Site Set-Up
Pump House cum Switch Room	
CONS.C1.5110	Commence Pump House Cum Switch Room (2B+ GF)

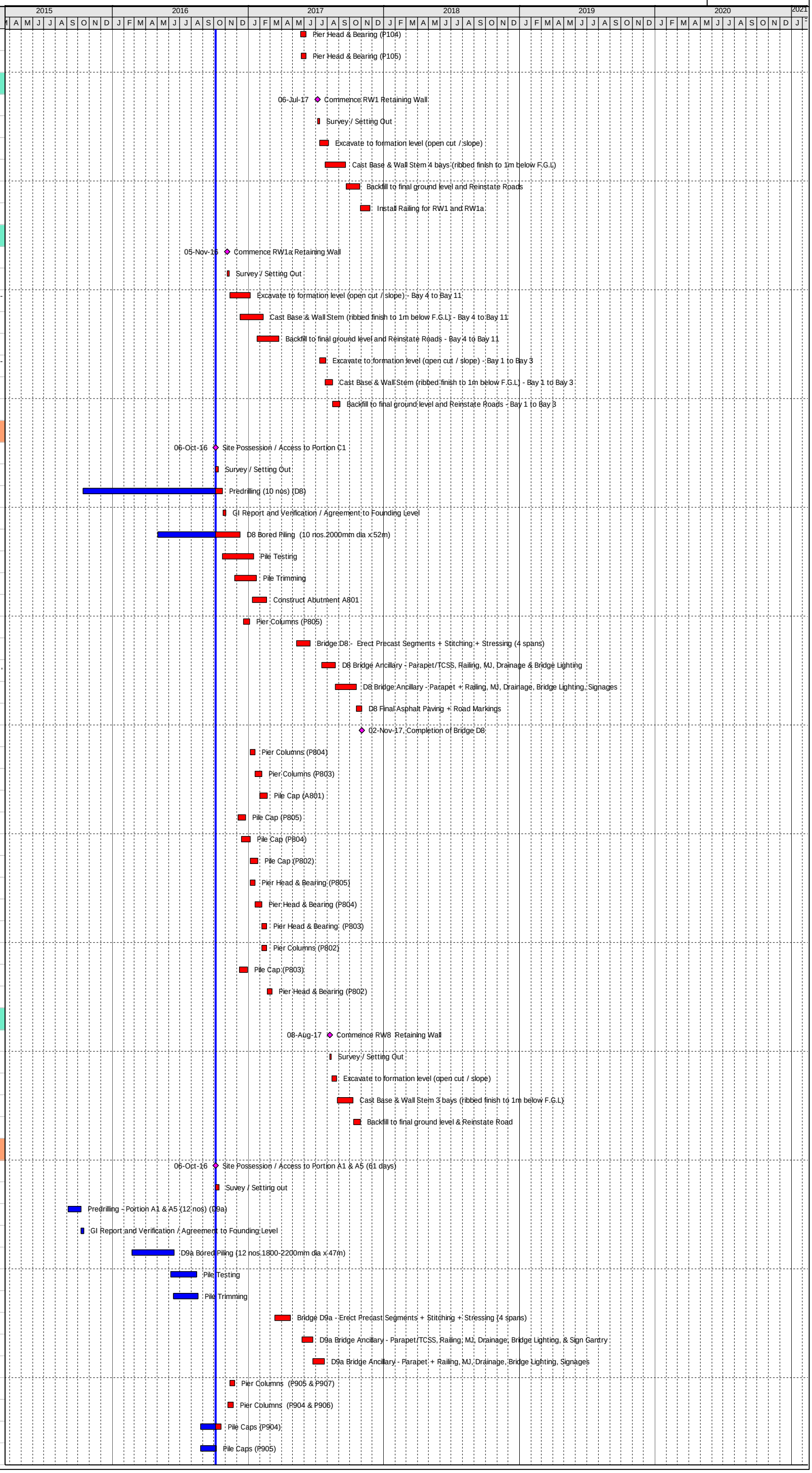
Activity ID	Activity Name
CONS.C1.5120	Mobilisation / Survey/ Setting Out
CONS.C1.5125	Cofferdam - Sheet Piling
CONS.C1.5130	Install Dewatering Wells + Pump Test
CONS.C1.5140	ELS Works to Formation level (Basement 2)
CONS.C1.5150	Blinding, Waterproofing and Base Slab
CONS.C1.5160	Construct Walls and Slab to Upper Basement
CONS.C1.5170	Construct Walls and Slab to Ground Level
CONS.C1.5200	Construct Walls and Roof Slab
CONS.C1.5205	ABWF & Building Service Works to Pump House / Switch Room
CONS.C1.5210	Achievement of Stage 5 (KD6) / Interface with C3
CONS.C1.5215	Pump House/ Switch Rm - Allow Access to Contract HY/2013/03
CONS.C1.5225	MEP installation for Pump House/Switch Room by C3
CONS.C1.5235	Testing and Commissioning and Statutory Permits / Certification by FSD / BD
CONS.C1.5245	ABWF Works and External Works
CONS.C1.5255	E&M Equipment Installation
Box Culverts	
Box Culvert D - Cost Savings Design	
Contractors Design	
AD.A1.0001	Approval in Principle for Cost Savings Design
AD.A1.0100	Detailed Design / Shop Drawings and Material Submission
AD.A1.0110	Engineer's Review / Approval
Preliminary Driven Pile and Load Test	
AD.A1.0470.30	Predrilling (1 nos) (Box Culvert D)
AD.A1.0470.40	GI Report and Verification / Agreement to Founding Level
AD.A1.0510	Engineer advise Test Pile/ Preliminary Driven H Pile at Box Culvert D
AD.A1.0520	Mobilize Plant & Set-up Support
AD.A1.0530	Preliminary Driven H Pile (2 nos)
AD.A1.0540	Pile Load Testing and Submit Report
Box Culvert D - 15 Bays	
AD.A1.1055.30	Predrilling at Portion A1 (30 nos) (Box Culvert D)
AD.A1.1055.40	GI Report and Verification / Agreement to Founding Level
AD.A1.1095.30	Box Culvert - Base Slab, Wall & Top Slab - Part 1 (8 bays)
AD.A1.1095.40	Box Culvert - Base Slab, Wall & Top Slab - Part 2 (7 bays)
AD.A1.1110	Access to Portion A1 (Interface with Contract 03)
AD.A1.1120	Box Culvert D - Driven H-Pile Works
AD.A1.1130	Install Dewatering Wells + Pump Test + Open Cut Excavation to formation
AD.A1.1150	Backfill / Reinstate and Connect UU and Road Works SOL101 and SOL102
AD.A1.1160	Survey / Setting Out
AD.A1.1170	Pile Testing
AD.A1.1180	Mobilization and Plant Set Up
AD.A1.2250	Pile Trimming and Pile Caps (30 nos)
Box Culvert D - 3 Bays and Outfall	
AD.B1.1180.30	Predrilling (6 nos) (Box Culvert D along Seawall Area)
AD.B1.1180.40	GI Report and Verification / Agreement to Founding Level
AD.B1.2235	Pile Trimming and Construction of Pile Caps
AD.B1.2250	Remove Piling Platform
AD.B1.2260	Install Seawall Block & Rockfill near Seawall
AD.B1.2270	General Fill
AD.B1.2280	ELS Works (2 levels of Strut)
AD.B1.2330	Box Culvert D - Driven H Pile with Steel Plate
AD.B1.2350	Backfill, Remove Seawall Blocks & Reinstate Rock Armour
AD.B1.2360	Complete Box Culvert D - based on CSD
AD.B1.2370	Construct Box Culvert Outfall & Connect Drainage
AD.B1.2380	Divert/Shift Haul Road (on top of completed box culvert)
AD.B1.2390	Sheet Piling Works
AD.B1.2400	Install Dewatering Wells and Carry Out Pumping Test
AD.B1.2410	Commence Works on Box Culvert Outfall
MDN Application for Marine Plants	
CONS.OF.1010	Prepare Documents for Statutory Submission to Marine Department
CONS.OF.1020	MD Vetting, Site Inspection and Approval
CONS.OF.1030	Marine Department Issues Permit / Consent
Box Culvert C (Portion C1)	
Preliminary Driven Piles and Load Testing	
CONS.C1.0450	Commence Preliminary Driven H Pile at Box Culvert C
CONS.C1.0460	Mobilise Plant & Set-up Support
CONS.C1.0470.	Predrilling (4 nos) (Box Culvert C)



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



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



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Activity ID	Activity Name
CONS.A5.2160	Pier Head & Bearing (P905 & P907)
CONS.A5.2180	Pier Head & Bearing (P904 & P906)
Bridge D9a in Portion C1 & C2	
CONS.C2.3010	Site Possession / Access to Portion C1 & C2 (184 days)
CONS.C2.3015	Survey / Setting Out
CONS.C2.3020.	Predrilling - Portion C1 & C2 (8 nos) (D9a)
CONS.C2.3020.	GI Report and Verification / Agreement to Founding Level
CONS.C2.3030	D9a in Portion C1 & C2 Bored Piling (8 nos.1800-2200mm dia x 47m)
CONS.C2.3035	Pile Testing
CONS.C2.3040	Pile Trimming
CONS.C2.3070	Construct Abutment A901
CONS.C2.3080	Bridge D9a (C1 & C2) - Erect Precast Segments + Stitching + Stressing (2 spans)
CONS.C2.3085	D9a (C1 & C2) Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign
CONS.C2.3095	Completion of Works in Section VI (KD13)
CONS.C2.3100	Bridge D9a (C1 & C2) - Erect Precast Segments + Stitching + Stressing (1 span)
CONS.C2.3110	D9a Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry
CONS.C2.3115	D9a Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages
CONS.C2.3120	D9a Final Asphalt Paving + Road Markings
CONS.C2.3130	Completion of Bridge D9a
CONS.C2.3400	Pier Columns (P902)
CONS.C2.3410	Pier Columns (P903)
CONS.C2.3440	Pile Caps (P902)
CONS.C2.3450	Pile Caps (P903)
CONS.C2.3470	Pier Head & Bearing (P902)
CONS.C2.3480	Pier Head & Bearing (P903)
CONS.C2.3560	Pile Caps (A901)
Bridge D9b	
CONS.A1.1105	Access to Portion A1
CONS.A1.1108	Survey / Setting Out
CONS.A1.1110.1	Predrilling (8 nos incl. 4 nos for P910) (D9b)
CONS.A1.1110.2	GI Report and Verification / Agreement to Founding Level
CONS.A1.1120	D9b Bored Piling (8 nos. 2000mm dia x 49m) including 4 for P910
CONS.A1.1125	Pile Testing
CONS.A1.1130	Pile Trimming
CONS.A1.1160	Bridge D9b - Erect Precast Segments + Stitching + Stressing (3 spans)
CONS.A1.1170	D9b Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage & Bridge Lighting
CONS.A1.1175	D9b Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages
CONS.A1.1180	D9b Final Asphalt Paving + Road Markings
CONS.A1.1190	Bridge D9b complete
CONS.A1.8750	Pier Columns (P908)
CONS.A1.8760	Pier Columns (P909)
CONS.A1.8770	Pier Columns (P910) - A (Portal)
CONS.A1.8780	Pier Columns (P910) - B (Portal)
CONS.A1.9230	Pile Caps (P908)
CONS.A1.9240	Pile Caps (P909)
CONS.A1.9250	Pile Caps (P910 - A)
CONS.A1.9260	Pile Caps (P910 - B)
CONS.A1.9270	Pier Head & Bearing (P908)
CONS.A1.9280	Pier Head & Bearing (P909)
Bridge D9c	
CONS.A1.1192	Site Possession / Access to Portion A1 & A2
CONS.A1.1194	Survey / Setting Out
CONS.A1.1200.1	Predrilling (8 nos) (D9c)
CONS.A1.1200.2	GI Report and Verification / Agreement to Founding Level
CONS.A1.1210	D9c Bored Piling (8 nos. 2000mm dia x 62m)
CONS.A1.1215	Pile Testing
CONS.A1.1220	Pile Trimming
CONS.A1.1240	Bridge D9c - Construct Deck (Cast in Situ) (1 span, P910 to P911)
CONS.A1.1250	Bridge D9c - Erect Precast Segments Pier P911 to Pier P913 + Stitching + Stressing (2 spans)
CONS.A1.1260	D9c Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage & Bridge Lighting
CONS.A1.1270	D9c Bridge Ancillary - Parapet + Railing, MJ, Drainage, Bridge Lighting, Signages
CONS.A1.8790	Pier Columns (P913)
CONS.A1.8800	Pier Columns (P912)
CONS.A1.8810	Pier Columns (P911)
CONS.A1.9190	Pile Cap (P913)
CONS.A1.9200	Pile Cap (P912)

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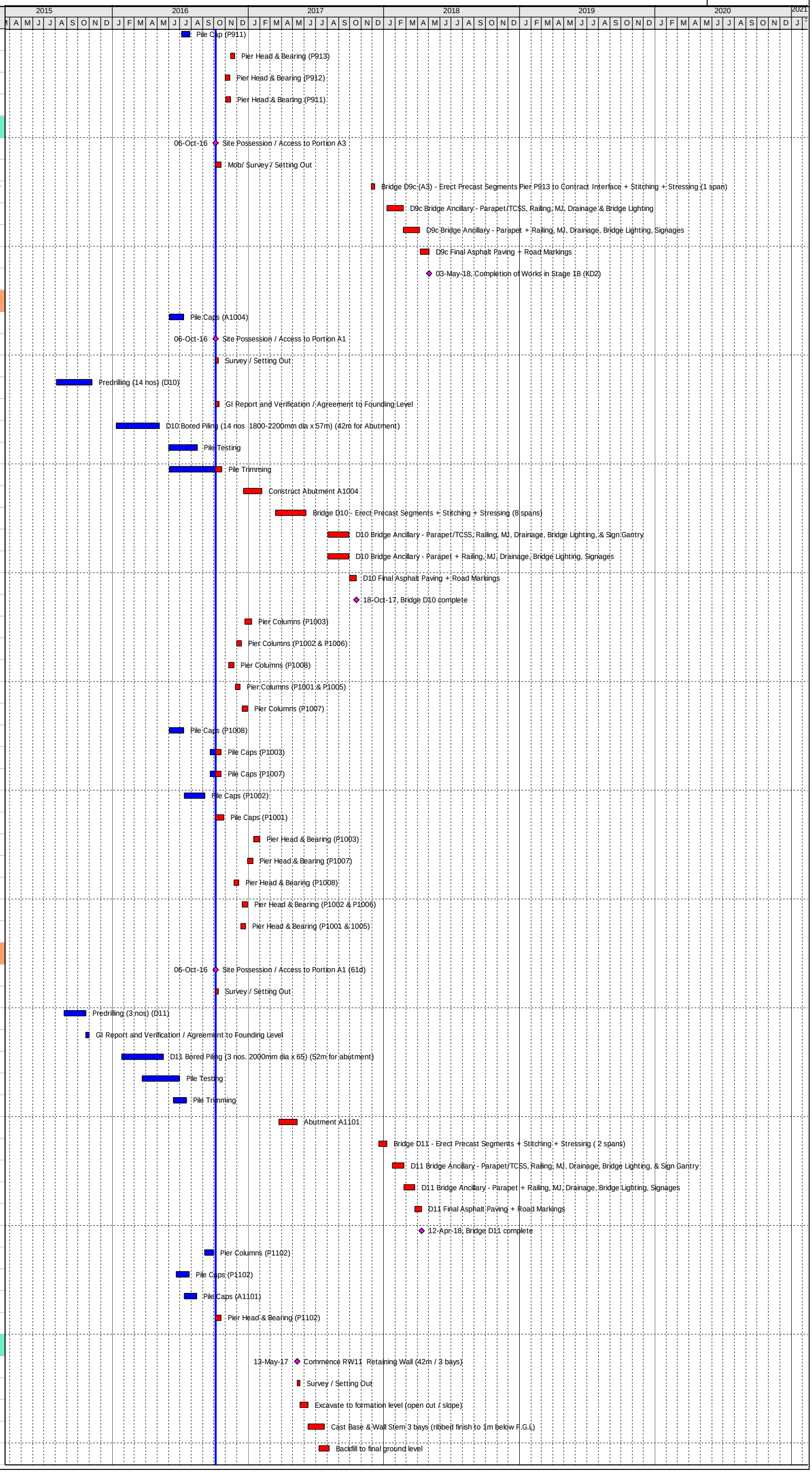
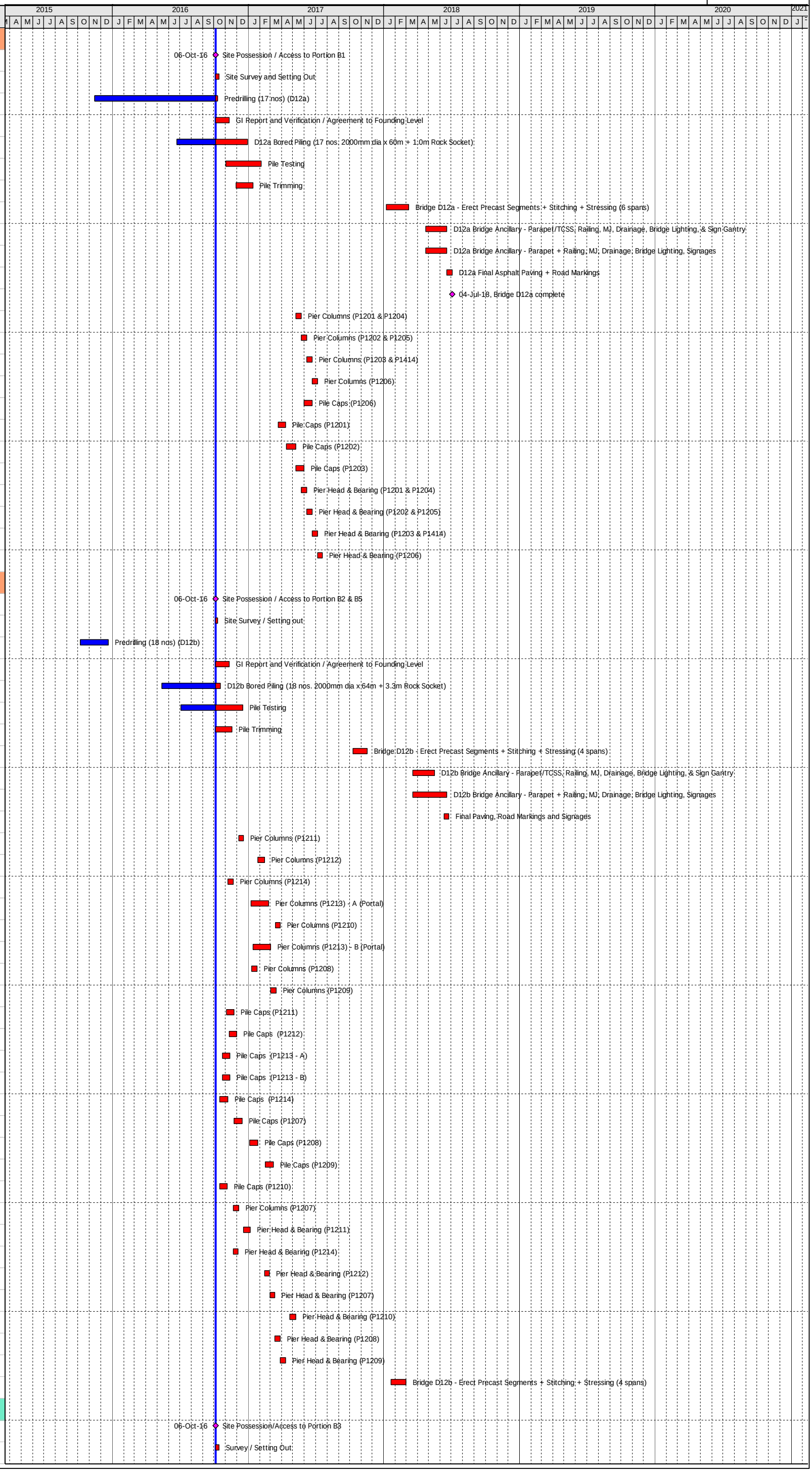
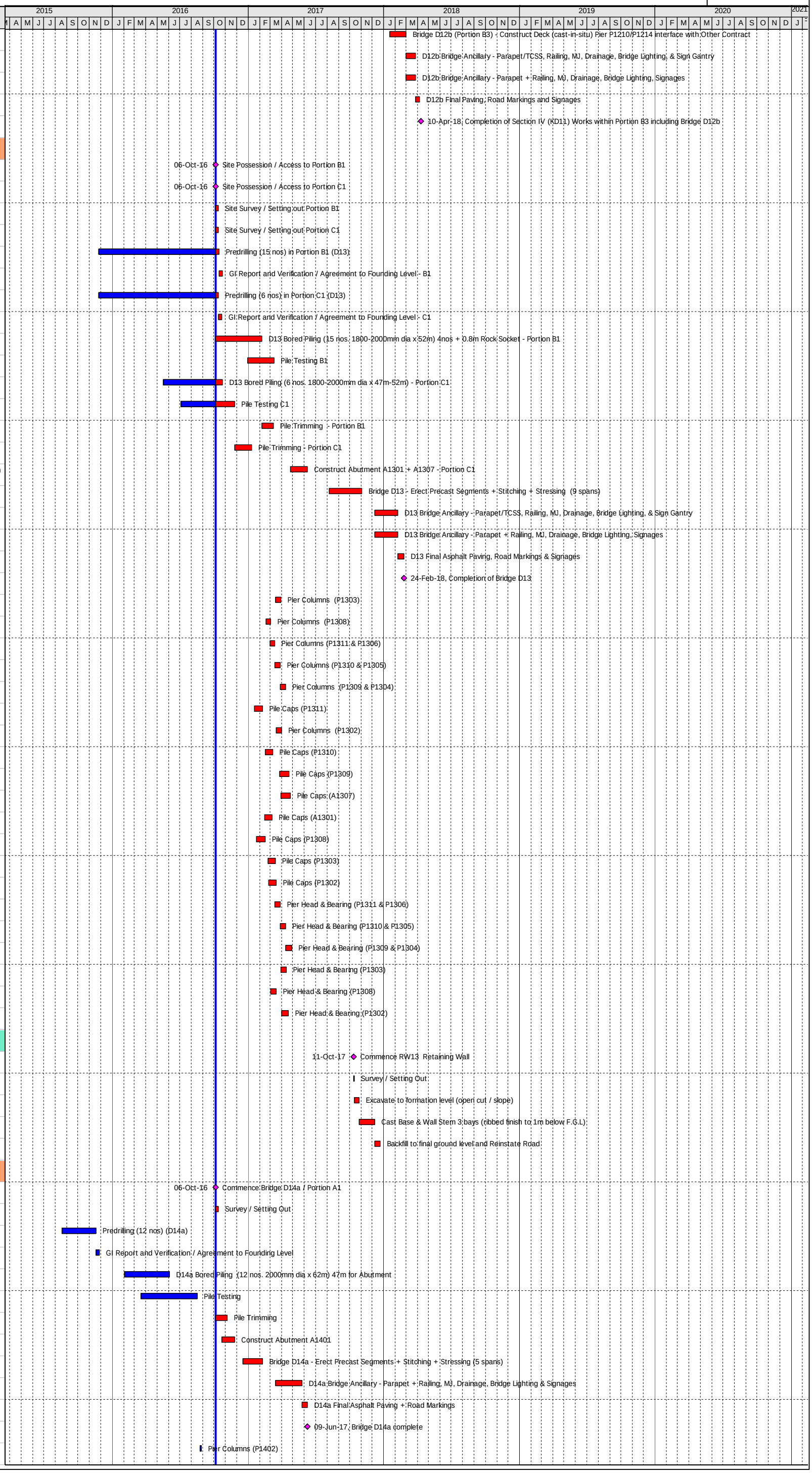
Activity ID	Activity Name
CONS.A1.9210	Pile Cap (P911)
CONS.A1.9310	Pier Head & Bearing (P913)
CONS.A1.9320	Pier Head & Bearing (P912)
CONS.A1.9330	Pier Head & Bearing (P911)
Bridge D9c in Portion A3 (Interface with Cont	
CONS.A3.1010	Site Possession / Access to Portion A3
CONS.A3.1020	Mob/ Survey /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



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

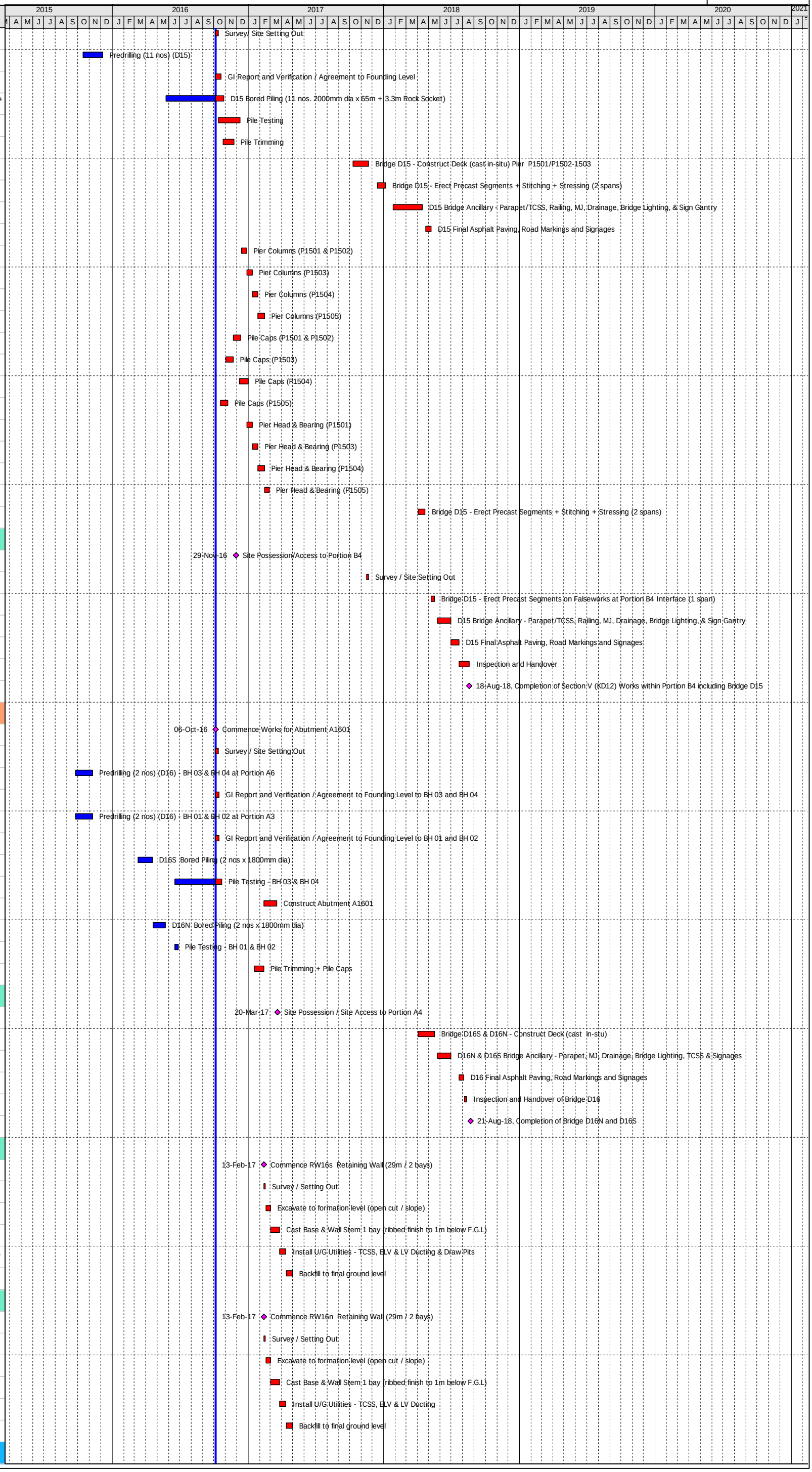


Activity ID	Activity Name
CONS.B3.2130	Bridge D12b (Portion B3) - Construct Deck (cast-in-situ) Pier P1210/P1214 interface with
CONS.B3.2140	D12b Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry
CONS.B3.2145	D12b Bridge Ancillary - Parapet + Railing, MJ, Drainage,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



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

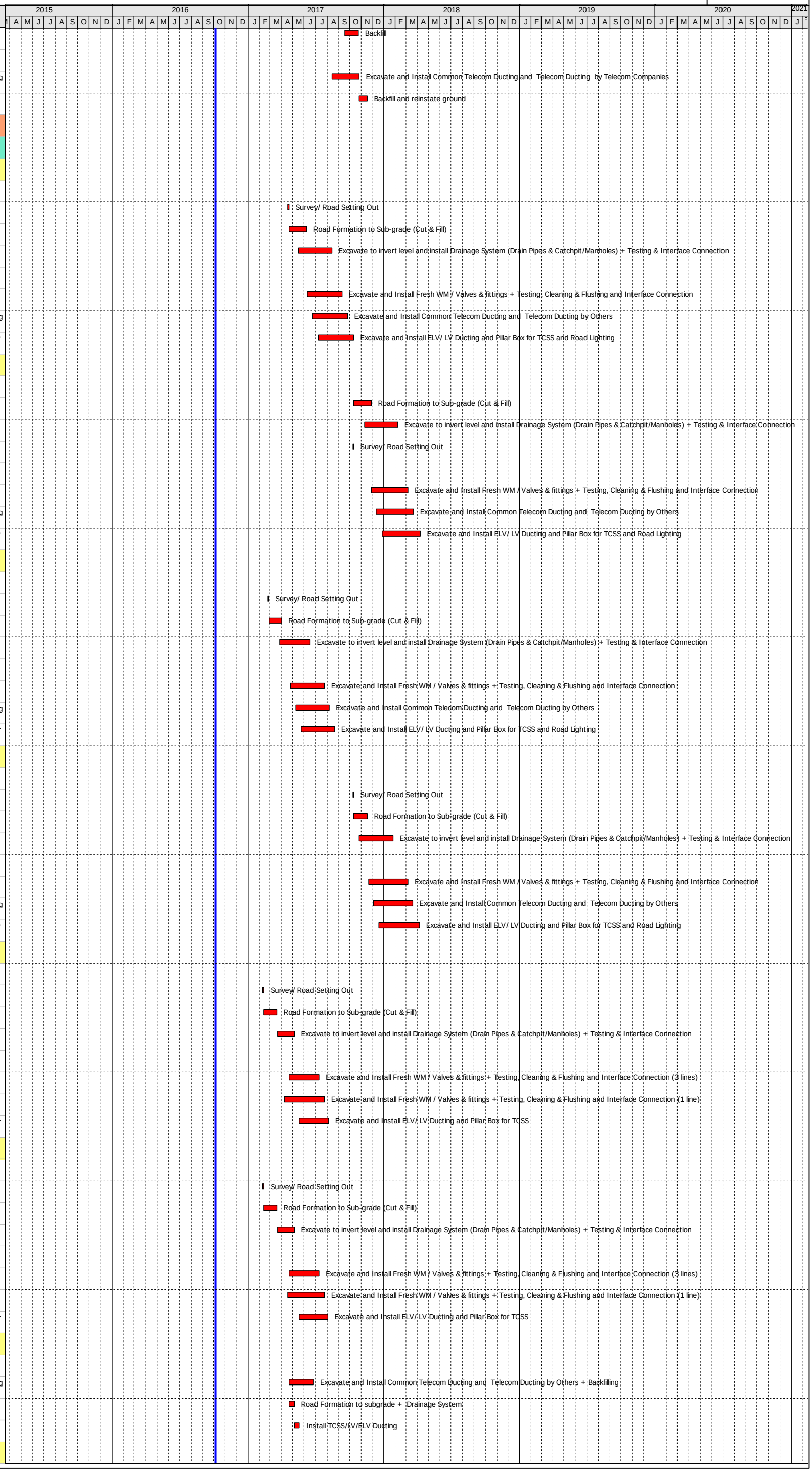
Activity ID	Activity Name
CONS.B5.2106	Survey/ Site Setting Out
CONS.B5.2110.1	Predrilling (11 nos) (D15)
CONS.B5.2110.2	GI Report and Verification / Agreement to Founding Level
CONS.B5.2120	D15 Bored Piling (11 nos. 2000mm dia x 65m + 3.3m Rock Socket)
CONS.B5.2125	Pile Testing
CONS.B5.2130	Pile Trimming
CONS.B5.2150	Bridge D15 - Construct Deck (cast in-situ) Pier P1501/P1502-1503
CONS.B5.2160	Bridge D15 - Erect Precast Segments + Stitching + Stressing (2 spans)
CONS.B5.2170	D15 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry
CONS.B5.2180	D15 Final Asphalt Paving, Road Markings and Signages
CONS.B5.2190	Pier Columns (P1501 & P1502)
CONS.B5.2210	Pier Columns (P1503)
CONS.B5.2220	Pier Columns (P1504)
CONS.B5.2230	Pier Columns (P1505)
CONS.B5.2250	Pile Caps (P1501 & P1502)
CONS.B5.2260	Pile Caps (P1503)
CONS.B5.2270	Pile Caps (P1504)
CONS.B5.2280	Pile Caps (P1505)
CONS.B5.2290	Pier Head & Bearing (P1501)
CONS.B5.2310	Pier Head & Bearing (P1503)
CONS.B5.2320	Pier Head & Bearing (P1504)
CONS.B5.2330	Pier Head & Bearing (P1505)
CONS.B5.2340	Bridge D15 - Erect Precast Segments + Stitching + Stressing (2 spans)
Bridge D15 in Portion B4 (Interface with Cont	
CONS.B4.2170	Site Possession/Access to Portion B4
CONS.B4.2180	Survey / Site Setting Out
CONS.B4.2190	Bridge D15 - Erect Precast Segments on Falseworks at Portion B4 Interface (1 span)
CONS.B4.2200	D15 Bridge Ancillary - Parapet/TCSS, Railing, MJ, Drainage, Bridge Lighting, & Sign Gantry
CONS.B4.2210	D15 Final Asphalt Paving, Road Markings and Signages
CONS.B4.2220	Inspection and Handover
CONS.B4.2230	Completion of Section V (KD12) Works within Portion B4 including Bridge D15
Bridge D16S and D16N and Abutment A1601 in	
CONS.A4.2230	Commence Works for Abutment A1601
CONS.A4.2240	Survey / Site Setting Out
CONS.A4.2250.1	Predrilling (2 nos) (D16) - BH 03 & BH 04 at Portion A6
CONS.A4.2250.2	GI Report and Verification / Agreement to Founding Level to BH 03 and BH 04
CONS.A4.2250.3	Predrilling (2 nos) (D16) - BH 01 & BH 02 at Portion A3
CONS.A4.2250.4	GI Report and Verification / Agreement to Founding Level to BH 01 and BH 02
CONS.A4.2260	D16S Bored Piling (2 nos x 1800mm dia)
CONS.A4.2265	Pile Testing - BH 03 & BH 04
CONS.A4.2280	Construct Abutment A1601
CONS.A4.2340	D16N Bored Piling (2 nos x 1800mm dia)
CONS.A4.2350	Pile Testing - BH 01 & BH 02
CONS.A4.2360	Pile Trimming + Pile Caps
Bridge D16S and D16N in Portion A4	
CONS.A4.2285	Site Possession / Site Access to Portion A4
CONS.A4.2290	Bridge D16S & D16N - Construct Deck (cast in-stu)
CONS.A4.2300	D16N & D16S Bridge Ancillary - Parapet, MJ, Drainage, Bridge Lighting, TCSS & Signages
CONS.A4.2310	D16 Final Asphalt Paving, Road Markings and Signages
CONS.A4.2320	Inspection and Handover of Bridge D16
CONS.A4.2330	Completion of Bridge D16N and D16S
RW16S (15m / 1 bay) in Portion A6	
CONS.A1.3500	Commence RW16s Retaining Wall (29m / 2 bays)
CONS.A1.3510	Survey / Setting Out
CONS.A1.3520	Excavate to formation level (open cut / slope)
CONS.A1.3530	Cast Base & Wall Stem 1 bay (ribbed finish to 1m below F.G.L)
CONS.A1.3540	Install U/G Utilities - TCSS, ELV & LV Ducting & Draw Pits
CONS.A1.3550	Backfill to final ground level
RW16N (15m / 1 bay) in Portion A6	
CONS.A1.3440	Commence RW16n Retaining Wall (29m / 2 bays)
CONS.A1.3450	Survey / Setting Out
CONS.A1.3460	Excavate to formation level (open cut / slope)
CONS.A1.3470	Cast Base & Wall Stem 1 bay (ribbed finish to 1m below F.G.L)
CONS.A1.3480	Install U/G Utilities - TCSS, ELV & LV Ducting
CONS.A1.3490	Backfill to final ground level
Depressed Road RC Structure	



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

Activity ID	Activity Name
CONS.RW.3890	Excavate and Install HV Cable Ducting on Carriageway (East of Pump House - Portion B
CONS.RW.3900	Excavate and Install HV Cable Ducting on Carriageway (West of Pump House - Portion
Drainage and U/G Utilities (West of Pump Hou	
Drainage & UU	
Road SOL 101 / 105 (Phase 1)	
Drainage System	
CONS.RW.22	Survey/ Road Setting Out
CONS.RW.22	Road Formation to Sub-grade (Cut & Fill)
CONS.RW.22	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RW.23	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RW.23	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others
CONS.RW.23	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
Road SOL 101 / 105 (Phase 2)	
Drainage System	
CONS.RW.34	Survey/ Road Setting Out
CONS.RW.34	Road Formation to Sub-grade (Cut & Fill)
CONS.RW.34	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RW.34	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RW.34	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others
CONS.RW.34	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
Road SOL 102 /106 /111 and the neigboring la	
Drainage System	
CONS.RW.24	Survey/ Road Setting Out
CONS.RW.24	Road Formation to Sub-grade (Cut & Fill)
CONS.RW.24	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RW.29	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RW.29	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others
CONS.RW.29	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
Road SOL 102 /106 /111 and the neigboring la	
Drainage System	
CONS.RW.34	Survey/ Road Setting Out
CONS.RW.34	Road Formation to Sub-grade (Cut & Fill)
CONS.RW.34	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RW.35	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RW.35	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others
CONS.RW.35	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
Road SOL 104 (Phase 1)	
Drainage System	
CONS.RW.24	Survey/ Road Setting Out
CONS.RW.24	Road Formation to Sub-grade (Cut & Fill)
CONS.RW.24	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RW.24	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RW.24	Excavate and Install Flush WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RW.24	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
Road SOL 104 (Phase 2)	
Drainage System	
CONS.RW.35	Survey/ Road Setting Out
CONS.RW.35	Road Formation to Sub-grade (Cut & Fill)
CONS.RW.35	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RW.35	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RW.35	Excavate and Install Flush WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RW.35	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
Undergound Utilties (ELV, Fresh WM & Teleco	
Work in Portion D1 and D2	
Sewage Rising main at Portion D1	
CONS.RM.101	Commence Works on Rising Main
CONS.RM.102	Site Survey / Setting Out Sewerage Alignment
CONS.RM.103	Excavate to Invert Level & Install 2 Sewage Rising Main DN100 CHC & CHD
CONS.RM.104	Construct Thrust Block
CONS.RM.105	Gravity Flow Testing

Activity ID	Activity Name
CONS.RM.106	Backfill
Telecom Crossing at Portion D2 and D1	
CONS.RW.28(	Excavate and Install Common Telecom Ducting and Telecom Ducting by Telecom Companies
CONS.RW.28	Backfill and reinstate ground
Drainage and U/G Utilities (East of Pump Hous	
Drainage & UU	
Road SOL 101 / 109 / 114 (Phase 1)	
Drainage System	
CONS.RE.101	Survey/ Road Setting Out
CONS.RE.102	Road Formation to Sub-grade (Cut & Fill)
CONS.RE.103	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RE.106	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.107	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others
CONS.RE.108	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS and Road Lighting
Road SOL 101 / 109 / 114 (Phase 2)	
Drainage System	
CONS.RE.420	Road Formation to Sub-grade (Cut & Fill)
CONS.RE.421	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
CONS.RE.422	Survey/ Road Setting Out
Installation of Underground Utilities	
CONS.RE.423	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.424	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others
CONS.RE.425	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS and Road Lighting
Road SOL 102 and the area outside the carriage	
Drainage System	
CONS.RE.197	Survey/ Road Setting Out
CONS.RE.198	Road Formation to Sub-grade (Cut & Fill)
CONS.RE.199	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RE.289	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.290	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others
CONS.RE.291	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS and Road Lighting
Road SOL 102 and the area outside the carriage	
Drainage System	
CONS.RE.426	Survey/ Road Setting Out
CONS.RE.427	Road Formation to Sub-grade (Cut & Fill)
CONS.RE.428	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RE.429	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.430	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others
CONS.RE.431	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS and Road Lighting
Road SOL 107 / 113 (Phase 1)	
Drainage System	
CONS.RE.200	Survey/ Road Setting Out
CONS.RE.201	Road Formation to Sub-grade (Cut & Fill)
CONS.RE.202	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RE.204	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.205	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.206	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
Road SOL 107 / 113 (Phase 2)	
Drainage System	
CONS.RE.432	Survey/ Road Setting Out
CONS.RE.433	Road Formation to Sub-grade (Cut & Fill)
CONS.RE.434	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RE.435	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.436	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.437	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
Road SOL 108 / 106 & SOL 110	
Adjacent to Road SOL 108 / 106, Abutment A9	
CONS.RE.207	Excavate and Install Common Telecom Ducting and Telecom Ducting by Others + Backfilling
CONS.RE.216	Road Formation to subgrade + Drainage System
CONS.RE.219	Install TCSS/LV/ELV Ducting
Portion A1 and A2 - Sub-Base Area	

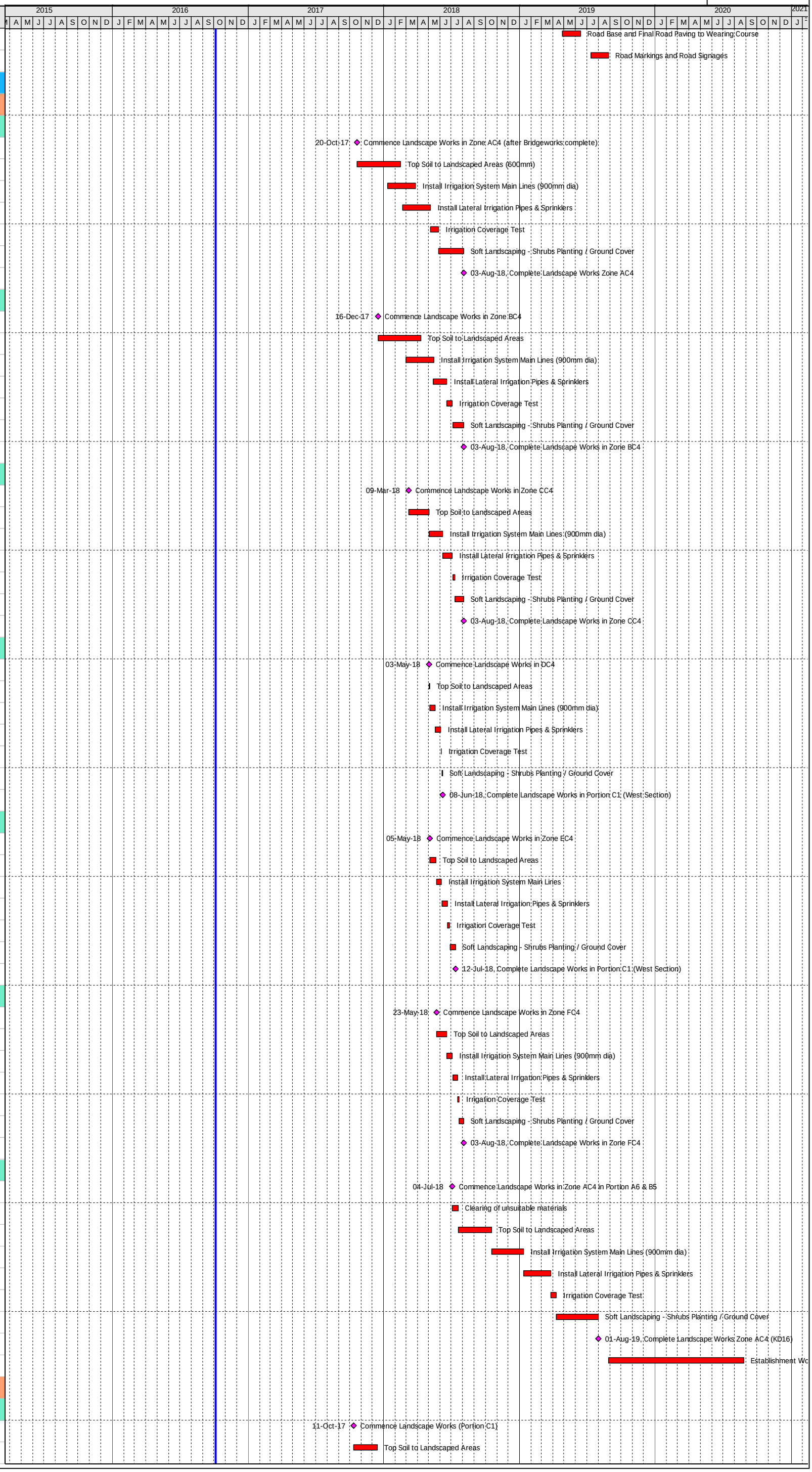


Activity ID	Activity Name
CONS.A1.4430	Demobilisation of Temporary Facilities on Site
CONS.A1.4440	Site Survey / Site Clearing
CONS.A1.4450	Area to Formation Level
CONS.A1.4460	Sub-Base Material Topping (Area 29,963 m2 x 100mm thk Subbase)
Area 3 (in Portion A6)	
Drainage System	
CONS.RE.4660	Survey/ Road Setting Out
CONS.RE.4670	Road Formation to Sub-grade (Cut & Fill)
CONS.RE.4680	Excavate to invert level and install Drainage System (Drain Pipes & Catchpit/Manholes) +
Installation of Underground Utilities	
CONS.RE.4690	Excavate and Install ELV/ LV Ducting and Pillar Box for TCSS
CONS.RE.4700	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
CONS.RE.4710	Excavate and Install Fresh WM / Valves & fittings + Testing, Cleaning & Flushing and
Roadworks	
Area 1 (West of Pump House) (Portion C1)	
Road Works	
Road SOL 101 / 105 (Phase 1)	
Kerbing and Footings for Railing, Fencing, Sign	
CONS.RW.30(	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RW.30:	Road Formation to Sub-base
CONS.RW.30(	Construct Precast Road Kerbings
Road Works to Road Base and Base Course	
CONS.RW.30:	Road Formation to Road Base
CONS.RW.30(	Road Formation to Base Course
Installation of Railing and Fencing + Road Ligl	
CONS.RW.30:	Install Road Railing and Fencing
CONS.RW.30(	Install Road Lighting and Signages
Final Paving and Road Markings	
CONS.RW.29:	Cleaning and Rectification Works
CONS.RW.29(	Final Road Paving (Wearing Course)
CONS.RW.29:	Road Markings and Road Signages
Road SOL 101 / 105 (Phase 2)	
Kerbing and Footings for Railing, Fencing, Sign	
CONS.RW.36:	Road Formation to Sub-base
CONS.RW.36(	Construct Precast Road Kerbings
Road Works to Road Base and Base Course	
CONS.RW.36:	Road Formation to Road Base
CONS.RW.36(	Road Formation to Base Course
Installation of Railing and Fencing + Road Ligl	
CONS.RW.36:	Install Road Railing and Fencing
CONS.RW.36(	Install Road Lighting and Signages
Final Paving and Road Markings	
CONS.RW.35:	Cleaning and Rectification Works
CONS.RW.36(	Final Road Paving (Wearing Course)
CONS.RW.36:	Road Markings and Road Signages
Road SOL 102 /106 /111 (Phase 1)	
Kerbing and Footings for Railing, Fencing, Sign	
CONS.RW.32:	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RW.32(	Road Formation to Sub-base
CONS.RW.32:	Construct Precast Road Kerbings
Road Works to Road Base and Base Course	
CONS.RW.32:	Road Formation to Road Base
CONS.RW.32(	Road Formation to Base Course
Installation of Railing and Fencing + Road Ligl	
CONS.RW.32:	Install Road Railing and Fencing
CONS.RW.32(	Install Road Lighting and Signages
Final Paving and Road Markings	
CONS.RW.32:	Final Road Paving (Wearing Course)
CONS.RW.32(	Road Markings and Road Signages
Road SOL 102 /106 /111 (Phase 2)	
Kerbing and Footings for Railing, Fencing, Sign	
CONS.RW.37:	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RW.37(	Road Formation to Sub-base
CONS.RW.37:	Construct Precast Road Kerbings
Road Works to Road Base and Base Course	
CONS.RW.36:	Road Formation to Road Base

Activity ID	Activity Name
CONS.RW.37(	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RW.37:	Install Road Railing and Fencing
CONS.RW.37:	Install Road Lighting and Signages
	Final Paving and Road Markings
CONS.RW.37:	Final Road Paving (Wearing Course)
CONS.RW.37(	Road Markings and Road Signages
	Road SOL 104 (Phase 1)
	Kerbing and Footings for Railing, Fencing, Sign
CONS.RW.33:	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RW.33:	Road Formation to Sub-base
CONS.RW.33(	Construct Precast Road Kerbings
	Road Works to Road Base and Base Course
CONS.RW.33:	Road Formation to Road Base
CONS.RW.33(	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RW.33:	Install Road Railing and Fencing
CONS.RW.33(	Install Road Lighting and Signages
	Final Paving and Road Markings
CONS.RW.33(	Final Road Paving (Wearing Course)
CONS.RW.33:	Road Markings and Road Signages
	Road SOL 104 (Phase 2)
	Kerbing and Footings for Railing, Fencing, Sign
CONS.RW.38(	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RW.38:	Road Formation to Sub-base
CONS.RW.38(	Construct Precast Road Kerbings
	Road Works to Road Base and Base Course
CONS.RW.38:	Road Formation to Road Base
CONS.RW.38(	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RW.38:	Install Road Railing and Fencing
CONS.RW.38(	Install Road Lighting and Signages
	Final Paving and Road Markings
CONS.RW.37(	Final Road Paving (Wearing Course)
CONS.RW.37:	Road Markings and Road Signages
	Area 2 (East of Pump House Portion C1, A1, A2
	Road Works
	Road SOL 101 / 109 / 114 (Phase 1)
	Kerbing and Footings for Railing, Fencing, Sign
CONS.RE.384	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RE.385	Road Formation to Sub-base
CONS.RE.386	Construct Precast Road Kerbings
	Road Works to Road Base and Base Course
CONS.RE.372	Road Formation to Road Base
CONS.RE.373	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RE.374	Install Road Railing and Fencing
CONS.RE.375	Install Road Lighting and Signages
	Road SOL 101 / 109 / 114 (Phase 2)
	Kerbing and Footings for Railing, Fencing, Sign
CONS.RE.442	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RE.443	Road Formation to Sub-base
CONS.RE.444	Construct Precast Road Kerbings
	Road Works to Road Base and Base Course
CONS.RE.438	Road Formation to Road Base
CONS.RE.439	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RE.440	Install Road Railing and Fencing
CONS.RE.441	Install Road Lighting and Signages
	Road SOL 102 (Phase 1)
	Kerbing and Footings for Railing, Fencing, Sign
CONS.RE.415	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RE.416	Construct Precast Road Kerbings
CONS.RE.417	Road Formation to Sub-base
	Road Works to Road Base and Base Course
CONS.RE.410	Road Formation to Road Base

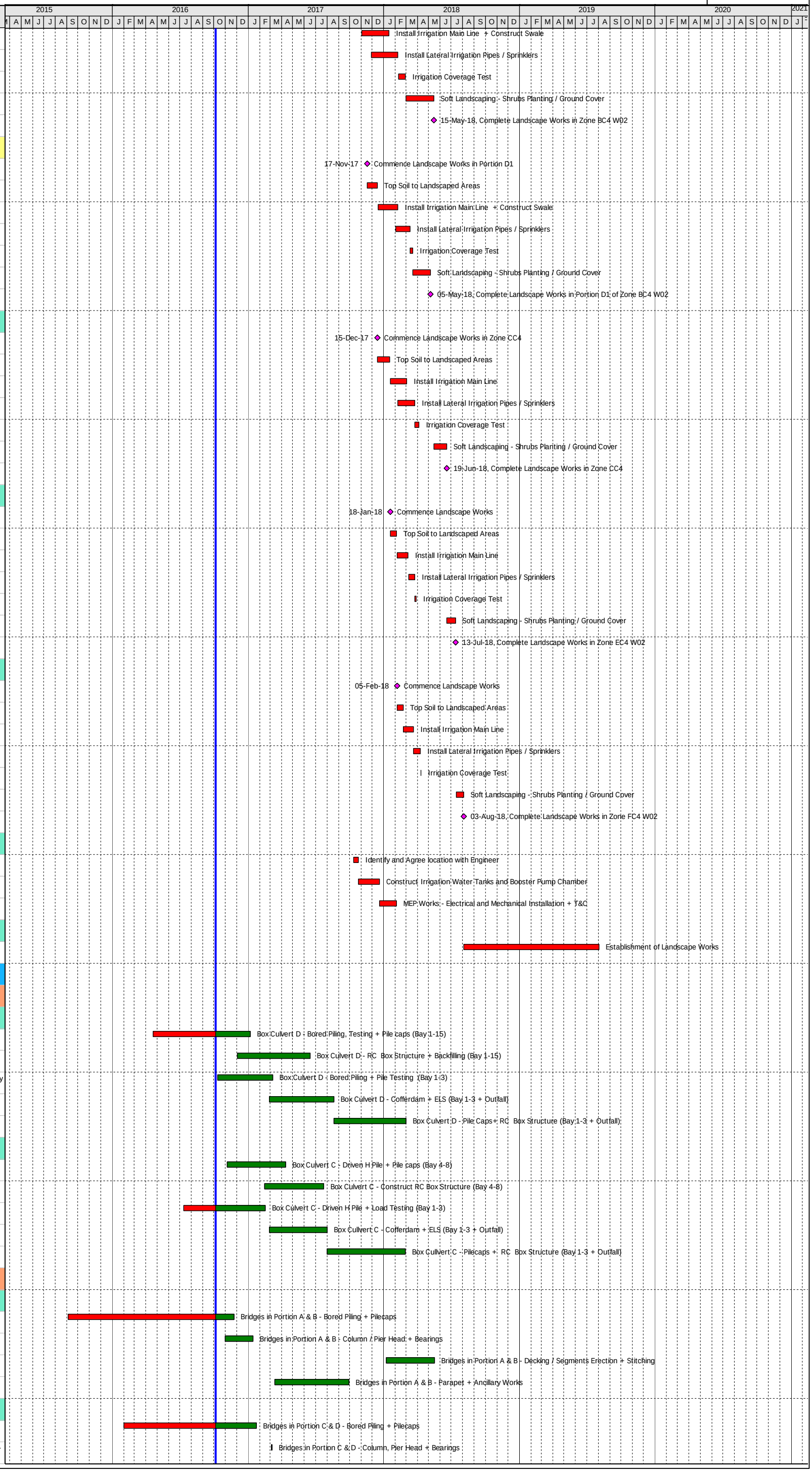
Activity ID	Activity Name
CONS.RE.411	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RE.418	Install Road Railing and Fencing
CONS.RE.419	Install Road Lighting and Signages
	Final Paving and Road Markings
CONS.RE.402	Final Road Paving (Wearing Course)
CONS.RE.403	Road Markings and Road Signages
	Road SOL 102 (Phase 2)
	Kerbing and Footings for Railing, Fencing, Sign
CONS.RE.449	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RE.450	Construct Precast Road Kerbings
CONS.RE.451	Road Formation to Sub-base
	Road Works to Road Base and Base Course
CONS.RE.447	Road Formation to Road Base
CONS.RE.448	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RE.452	Install Road Railing and Fencing
CONS.RE.453	Install Road Lighting and Signages
	Final Paving and Road Markings
CONS.RE.445	Final Road Paving (Wearing Course)
CONS.RE.446	Road Markings and Road Signages
	Road SOL 107 / 113 (Phase 1)
	Kerbing and Footings for Railing, Fencing, Sign
CONS.RE.393	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RE.394	Road Formation to Sub-base
CONS.RE.395	Construct Precast Road Kerbings
	Road Works to Road Base and Base Course
CONS.RE.396	Road Formation to Road Base
CONS.RE.397	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RE.398	Install Road Railing and Fencing
CONS.RE.399	Install Road Lighting and Signages
	Final Paving and Road Markings
CONS.RE.400	Final Road Paving (Wearing Course)
CONS.RE.401	Road Markings and Road Signages
	Road SOL 107 / 113 (Phase 2)
	Kerbing and Footings for Railing, Fencing, Sign
CONS.RE.454	Excavate and Construct Footings for Road Lightings / Railing / Fencing and Signages
CONS.RE.455	Road Formation to Sub-base
CONS.RE.456	Construct Precast Road Kerbings
	Road Works to Road Base and Base Course
CONS.RE.457	Road Formation to Road Base
CONS.RE.458	Road Formation to Base Course
	Installation of Railing and Fencing + Road Ligl
CONS.RE.459	Install Road Railing and Fencing
CONS.RE.460	Install Road Lighting and Signages
	Final Paving and Road Markings
CONS.RE.461	Final Road Paving (Wearing Course)
CONS.RE.462	Road Markings and Road Signages
	Road SOL 108 / 106 & SOL 110
	Adjacent to Road SOL 108 / 106, Abutment A9(
CONS.RE.362	Excavate and Construct footing for Railing and Road lighting
CONS.RE.363	Road formation to Subbase
CONS.RE.364	Construct Precast Road Kerbings
CONS.RE.365	Road formation to Road base and Base course
CONS.RE.366	Install Road Lighting, Railing and Signages
CONS.RE.367	Final Road Paving and Road markings (KD13 - Completion of Section VI)
	Portion A1 and A2 - Sub-Base Area
CONS.A1.8710	Demobilisation of Temporary Facilities on Site
CONS.A1.8720	Site Survey / Site Clearing
CONS.A1.8730	Area to Formation Level
CONS.A1.8740	Sub-Base Material Topping (Area 29,963 m2 x 100mm thk Subbase)
	Area 3 (in Portion A6)
	Final Paving and Road Markings
	Portion A6 - Final Paving and Road Markings
CONS.RE.3780	Road Clearing

Activity ID	Activity Name
CONS.RE.3790	Road Base and Final Road Paving to Wearing Course
CONS.RE.3800	Road Markings and Road Signages
Landscaping and Irrigation System	
Landscaping - Water Meter W04	
Zone AC4	
CONS.A1.8120	Commence Landscape Works in Zone AC4 (after Bridgeworks complete)
CONS.A1.8130	Top Soil to Landscaped Areas (600mm)
CONS.A1.8140	Install Irrigation System Main Lines (900mm dia)
CONS.A1.8150	Install Lateral Irrigation Pipes & Sprinklers
CONS.A1.8160	Irrigation Coverage Test
CONS.A1.8170	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.A1.8180	Complete Landscape Works Zone AC4
Zone BC4	
CONS.A1.8200	Commence Landscape Works in Zone BC4
CONS.A1.8210	Top Soil to Landscaped Areas
CONS.A1.8220	Install Irrigation System Main Lines (900mm dia)
CONS.A1.8230	Install Lateral Irrigation Pipes & Sprinklers
CONS.A1.8240	Irrigation Coverage Test
CONS.A1.8250	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.A1.8260	Complete Landscape Works in Zone BC4
Zone CC4	
CONS.A1.8280	Commence Landscape Works in Zone CC4
CONS.A1.8290	Top Soil to Landscaped Areas
CONS.A1.8300	Install Irrigation System Main Lines (900mm dia)
CONS.A1.8310	Install Lateral Irrigation Pipes & Sprinklers
CONS.A1.8320	Irrigation Coverage Test
CONS.A1.8330	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.A1.8340	Complete Landscape Works in Zone CC4
Zone DC4	
CONS.A1.8360	Commence Landscape Works in DC4
CONS.A1.8370	Top Soil to Landscaped Areas
CONS.A1.8380	Install Irrigation System Main Lines (900mm dia)
CONS.A1.8390	Install Lateral Irrigation Pipes & Sprinklers
CONS.A1.8400	Irrigation Coverage Test
CONS.A1.8410	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.A1.8420	Complete Landscape Works in Portion C1 (West Section)
Zone EC4	
CONS.A1.8440	Commence Landscape Works in Zone EC4
CONS.A1.8450	Top Soil to Landscaped Areas
CONS.A1.8460	Install Irrigation System Main Lines
CONS.A1.8470	Install Lateral Irrigation Pipes & Sprinklers
CONS.A1.8480	Irrigation Coverage Test
CONS.A1.8490	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.A1.8500	Complete Landscape Works in Portion C1 (West Section)
Zone FC4	
CONS.A1.8520	Commence Landscape Works in Zone FC4
CONS.A1.8530	Top Soil to Landscaped Areas
CONS.A1.8540	Install Irrigation System Main Lines (900mm dia)
CONS.A1.8550	Install Lateral Irrigation Pipes & Sprinklers
CONS.A1.8560	Irrigation Coverage Test
CONS.A1.8570	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.A1.8580	Complete Landscape Works in Zone FC4
Landscape Softworks in Portion A6 and B5	
CONS.A1.8590	Commence Landscape Works in Zone AC4 in Portion A6 & B5
CONS.A1.8595	Clearing of unsuitable materials
CONS.A1.8600	Top Soil to Landscaped Areas
CONS.A1.8610	Install Irrigation System Main Lines (900mm dia)
CONS.A1.8620	Install Lateral Irrigation Pipes & Sprinklers
CONS.A1.8630	Irrigation Coverage Test
CONS.A1.8640	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.A1.8650	Complete Landscape Works Zone AC4 (KD16)
CONS.A1.8660	Establishment Works for Landscape Softworks in Portion A6 and B5
Landscaping - Water Meter W02	
Zone BC4	
CONS.C1.8200	Commence Landscape Works (Portion C1)
CONS.C1.8210	Top Soil to Landscaped Areas



HY/2013/04 - Hong Kong Boundary Crossing Facilities Infrastructure Works Stage II (Southern Portion)

Activity ID	Activity Name
CONS.C1.8220	Install Irrigation Main Line + Construct Swale
CONS.C1.8230	Install Lateral Irrigation Pipes / Sprinklers
CONS.C1.8240	Irrigation Coverage Test
CONS.C1.8250	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.C1.8260	Complete Landscape Works in Zone BC4 W02
Zone BC4 in Portion D1	
CONS.C1.8600	Commence Landscape Works in Portion D1
CONS.C1.8610	Top Soil to Landscaped Areas
CONS.C1.8620	Install Irrigation Main Line + Construct Swale
CONS.C1.8630	Install Lateral Irrigation Pipes / Sprinklers
CONS.C1.8640	Irrigation Coverage Test
CONS.C1.8650	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.C1.8660	Complete Landscape Works in Portion D1 of Zone BC4 W02
Zone CC4	
CONS.C1.8270	Commence Landscape Works in Zone CC4
CONS.C1.8280	Top Soil to Landscaped Areas
CONS.C1.8290	Install Irrigation Main Line
CONS.C1.8300	Install Lateral Irrigation Pipes / Sprinklers
CONS.C1.8310	Irrigation Coverage Test
CONS.C1.8320	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.C1.8330	Complete Landscape Works in Zone CC4
Zone EC4	
CONS.C1.8340	Commence Landscape Works
CONS.C1.8350	Top Soil to Landscaped Areas
CONS.C1.8360	Install Irrigation Main Line
CONS.C1.8370	Install Lateral Irrigation Pipes / Sprinklers
CONS.C1.8380	Irrigation Coverage Test
CONS.C1.8390	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.C1.8400	Complete Landscape Works in Zone EC4 W02
Zone FC4	
CONS.C1.8410	Commence Landscape Works
CONS.C1.8420	Top Soil to Landscaped Areas
CONS.C1.8430	Install Irrigation Main Line
CONS.C1.8440	Install Lateral Irrigation Pipes / Sprinklers
CONS.C1.8450	Irrigation Coverage Test
CONS.C1.8460	Soft Landscaping - Shrubs Planting / Ground Cover
CONS.C1.8470	Complete Landscape Works in Zone FC4 W02
Irrigation Water Tanks and Booster Pumps	
CONS.C1.8790	Identify and Agree location with Engineer
CONS.C1.8800	Construct Irrigation Water Tanks and Booster Pump Chamber
CONS.C1.8810	MEP Works - Electrical and Mechanical Installation + T&C
Establishment Period (1 year)	
CONS.C1.8190	Establishment of Landscape Works
Executive Summary	
Box Culverts	
Box Culvert D	
BCD.ES.1010	Box Culvert D - Bored Piling, Testing + Pile caps (Bay 1-15)
BCD.ES.1020	Box Culvert D - RC Box Structure + Backfilling (Bay 1-15)
BCD.ES.1030	Box Culvert D - Bored Piling + Pile Testing (Bay 1-3)
BCD.ES.1040	Box Culvert D - Cofferdam + ELS (Bay 1-3 + Outfall)
BCD.ES.1050	Box Culvert D - Pile Caps+ RC Box Structure (Bay 1-3 + Outfall)
Box Culvert C	
BCC.ES.2010	Box Culvert C - Driven H Pile + Pile caps (Bay 4-8)
BCC.ES.2020	Box Culvert C - Construct RC Box Structure (Bay 4-8)
BCC.ES.2030	Box Culvert C - Driven H Pile + Load Testing (Bay 1-3)
BCC.ES.2040	Box Cullvert C - Cofferdam + ELS (Bay 1-3 + Outfall)
BCC.ES.2050	Box Cullvert C - Pilecaps + RC Box Structure (Bay 1-3 + Outfall)
Bridge Works	
Bridges in Portion A & B	
BRG.ES.1010	Bridges in Portion A & B - Bored Piling + Pilecaps
BRG.ES.1020	Bridges in Portion A & B - Column / Pier Head + Bearings
BRG.ES.1030	Bridges in Portion A & B - Decking / Segments Erection + Stitching
BRG.ES.1040	Bridges in Portion A & B - Parapet + Ancillary Works
Bridges in Portion C & D	
BRG.ES.2010	Bridges in Portion C & D - Bored Piling + Pilecaps
BRG.ES.2020	Bridges in Portion C & D - Column, Pier Head + Bearings



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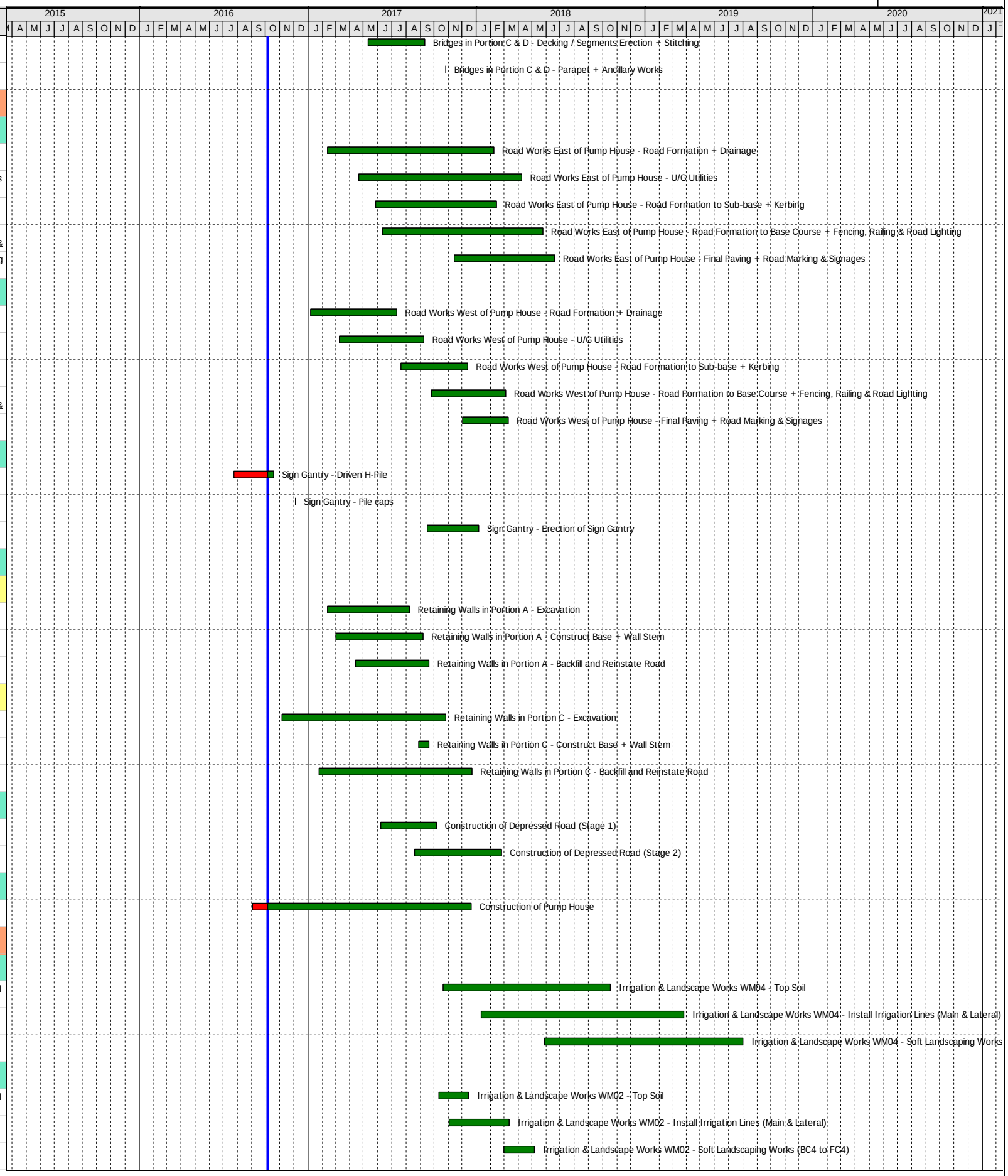
Activity ID	Activity Name
BRG.ES.2030	Bridges in Portion C & D - Decking / Segments Erection + Stitching
BRG.ES.2040	Bridges in Portion C & D - Parapet + Ancillary Works
Road Works	
Road Works - East of Pump House	
RDE.ES.1010	Road Works East of Pump House - Road Formation + Drainage
RDE.ES.1020	Road Works East of Pump House - U/G Utilities
RDE.ES.1030	Road Works East of Pump House - Road Formation to Sub-base + Kerbing
RDE.ES.1040	Road Works East of Pump House - Road Formation to Base Course + Fencing, Railing &
RDE.ES.1050	Road Works East of Pump House - Final Paving + Road Marking & Signages
Road Works - West of Pump House	
RDW.ES.2010	Road Works West of Pump House - Road Formation + Drainage
RDW.ES.2020	Road Works West of Pump House - U/G Utilities
RDW.ES.2030	Road Works West of Pump House - Road Formation to Sub-base + Kerbing
RDW.ES.2040	Road Works West of Pump House - Road Formation to Base Course + Fencing, Railing &
RDW.ES.2050	Road Works West of Pump House - Final Paving + Road Marking & Signages
Sign Gantry	
SGW.ES.1010	Sign Gantry - Driven H-Pile
SGW.ES.1020	Sign Gantry - Pile caps
SGW.ES.1030	Sign Gantry - Erection of Sign Gantry
Retaining Walls	
Retaining Walls in Portion A (East)	
RWW.ES.1040	Retaining Walls in Portion A - Excavation
RWW.ES.1050	Retaining Walls in Portion A - Construct Base + Wall Stem
RWW.ES.1060	Retaining Walls in Portion A - Backfill and Reinstate Road
Retaining Walls in Portion C (West)	
RWW.ES.1010	Retaining Walls in Portion C - Excavation
RWW.ES.1020	Retaining Walls in Portion C - Construct Base + Wall Stem
RWW.ES.1030	Retaining Walls in Portion C - Backfill and Reinstate Road
Depressed Road	
DRE.ES.1010	Construction of Depressed Road (Stage 1)
DRW.ES.1010	Construction of Depressed Road (Stage 2)
Pump House	
PHO.ES.1010	Construction of Pump House
Irrigation and Landscape	
Landscape Works - Water Meter O4	
LSW.ES.1010	Irrigation & Landscape Works WM04 - Top Soil
LSW.ES.1020	Irrigation & Landscape Works WM04 - Install Irrigation Lines (Main & Lateral)
LSW.ES.1030	Irrigation & Landscape Works WM04 - Soft Landscaping Works (AC4 to FC4)
Landscape Works - Water Meter 02	
LSW.ES.2010	Irrigation & Landscape Works WM02 - Top Soil
LSW.ES.2020	Irrigation & Landscape Works WM02 - Install Irrigation Lines (Main & Lateral)
LSW.ES.2030	Irrigation & Landscape Works WM02 - Soft Landscaping Works (BC4 to FC4)



Appendix D. Event and Action Plan

Event/Action Plan for Air Quality Monitoring

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

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

Event / Action Plan for Construction Noise Monitoring

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

Event / Action Plan for Water Quality Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	1. Repeat in situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working methods; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER; 5. Implement the agreed mitigation measures. 6. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling days	1. Repeat in situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Action level; 8. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER within 3 working days of notification; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Limit level being exceeded by one sampling day	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.
Limit level being exceeded by two or more consecutive sampling days	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Make agreement on the mitigation measures to be implemented; 5. Ensure mitigation measures are properly implemented; 6. Assess the effectiveness of the implemented mitigation measures; 7. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Take immediate action to avoid further exceedance; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 6. Implement the agreed mitigation measures; 7. Resubmit proposals of mitigation measures if problem still not under control; 8. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Event / Action Plan for Dolphin Monitoring

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, ER/SOR and Contractor; 5. Check monitoring data. 6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and finding with the ET and the Contractor.	1. Discuss monitoring with the IEC and any other measures proposed by the ET; 2. If ER/SOR is satisfied with the proposal of any other measures, ER/SOR to signify the agreement in writing on the measures to be implemented.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER/SOR; 3. Implement the agreed measures.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Limit Level	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, ER/SOR and Contractor of findings; 5. Check monitoring data; 6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. 7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and findings with the ET and the Contractor; 3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted by ET and Contractor and advise ER/SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise ER/SOR the results and findings accordingly.	1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 2. If ER/SOR is satisfied with the proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures. 3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring and/or any other mitigation measures.

Action Plan for Landscape and Visual

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

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

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

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
Air Quality				
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: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;	All construction sites	V
S5.5.6.2	A2	• When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides	All construction sites	V
S5.5.6.2	A2	• Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.	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 (covered by Contract No. HY/2013/04 (AMS2, AMS3C, AMS7B) & HY/2011/03 (AMS6))

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
S5.5.7.1	A6	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant: • Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system; • All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP; • Vents for all silos and cement/pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; • The materials which may generate airborne dusty emissions should be wetted by water spray system; • All receiving hoppers should be enclosed on three sides up to 3m above unloading point; • All conveyor transfer points should be totally enclosed; • All access and route roads within the premises should be paved and wetted; and • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body.	Selected representative dust monitoring station	N/A
S5.5.2.7	A7	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point: • All road surface within the barging facilities will be paved; • Dust enclosures will be provided for the loading ramp; • Vehicles will be required to pass through designated wheels wash facilities; and • Continuous water spray at the loading points.	All construction sites	N/A
Construction Noise (Air borne)				
S6.4.10	N1	1) Use of good site practices to limit noise emissions by considering the following: • only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.	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^2), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	For plant items listed in Appendix 6D of the EIA report at all construction sites	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 (covered by Contract No. HY/2013/04)
Sediment				
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
Waste Management (Construction Noise)				
S8.3.8	WM1	Construction and Demolition Material The following mitigation measures should be implemented in handling the waste: • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; and • Implement an enhanced Waste Management Plan similar to ETWB TC(W) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction. • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation.	All construction sites	V
S8.3.9-S8.3.11	WM2	C&D Waste • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden hoardings should not be used, as in other projects. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.	All construction sites	V
S8.2.12-S8.3.15	WM3	Chemical Waste • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.	All construction sites	V
S8.3.16	WM4	Sewage • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	All construction sites	V
S8.3.17	WM5	General Refuse • General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • 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	All construction sites	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminium cans, plastic bottles etc., should be provided. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes.		
Water Quality (Construction Phase)				
S9.11.1.1	W1	Mitigation during the marine works to reduce impacts to within acceptable levels have been recommended and will comprise a series of measures that restrict the method and sequencing of dredging/backfilling, as well as protection measures. Details of the measures are provided below. • Floating type perimeter silt curtains shall be around the HKBCF site before the commencement of marine works. • Silt curtain shall be fully maintained throughout the works.	Marine works	V
S9.11.1.7	W2	Land Works General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include: • wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; • sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the W PCO or collected for disposal offsite. The use of soakaways shall be avoided; • storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; • silt removal facilities, channels and manholes shall be maintained and any deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm; • temporary access roads should be surfaced with crushed stone or gravel; • rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; • open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; • manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers; • discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system; • all vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit; • wheel wash overflow shall be directed to silt removal facilities before being discharged to the storm drain; • the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel; • wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; • vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the W PCO or collected for off site disposal; • the Contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; • waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; • all fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and	Land-based works areas	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		• surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the stormwater system.		
S9.14	W3	Implement a water quality monitoring programme	At identified monitoring locations	V (covered by Contract No. HY/2013/04)
Ecology (Construction Phase)				
S10.7	E2	• Install silt curtain during the construction. Limit dredging and works fronts. • Good site practices. • Site runoff control.	Marine works and Land-based works areas	V
S10.7	E4	Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater	Land-based works areas	V
S10.7	E5	Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time	Land-based works areas	V
S10.7	E6	• Dolphin Exclusion Zone; • Dolphin watching plan	Marine works	V
S10.7	E7	• Decouple compressors and other equipment on working vessels • Avoidance of percussive piling	Marine works	V
S10.7	E8	• Control vessel speed • Skipper training • Predefined and regular routes for working vessels; avoid Brother Islands.	Marine Traffic	V
S10.10	E9	• Dolphin vessel monitoring	North Lantau and West Lantau	V (covered by Contract No. HY/2013/04)
Fisheries				
S11.7	F4	• Maritime Oil Spill Response Plan (MOSRP); • Contingency plan.	HKBCF	V
Landscape & Visual (Detailed Design Phase)				
S14.3.3.1	LV1	General design measures include: • Roadside planting and planting along the edge of the HKBCF Island is proposed; • Transplanting of mature trees in good health and amenity value where appropriate and reinstatement of areas disturbed during construction by compensatory hydro-seeding and planting; • Protection measures for the trees to be retained during construction activities; • Optimizing the sizes and spacing of the bridge columns; Fine-tuning the location of the bridge columns to avoid visually-sensitive locations; • Maximizing new tree, shrub and other vegetation planting to compensate tree felled and vegetation removed; • Providing planting area around peripheral of HKBCF for tree planting screening effect; • Providing salt-tolerant native trees along the planter strip at affected seawall and newly reclaimed coastline; • For HKBCF, providing aesthetic architectural design on the related buildings (e.g. similar materials for PCB building facade to Airport buildings, roof planting and subtle materials for other facilities buildings and so on), and the related infrastructure (e.g. parapet planting and transparent cover for elevated footbridges) to provide harmonious atmosphere of the HKBCF; and • 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.	HKBCF	V
Landscape & Visual (Construction Phase)				
S14.3.3.3	LV2	Mitigate both Landscape and Visual Impacts G1. Grass-hydroseed bare soil surface and stock pile areas. G2. Add planting strip and automatic irrigation system if appropriate at some portions of bridge footbridge to screen bridge and traffic. G3. 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	HKBCF	V

EIA Ref.	EM&A Log Ref.	Recommended Mitigation Measures	Location of the measures	Implementation Status
		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.		
S14.3.3.3	LV3	Mitigate Visual Impacts 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
EM&A				
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

f

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 5, 13, 17 and 27 December 2018, 2, 9, 16, 21 and 30 January 2019, and 8, 13, 20 and 25 February 2019.

Particular observations during the site inspections are described below.

28 November 2018

a. A chemical container without drip tray was observed on Bridge D15. Subsequently, the chemical container was removed. The observation was closed on 5 December 2018.

5 December 2018

a. Loose general refuse was observed near P1501 area. Subsequently, the general refuse near P1501 area was cleared. The observation was closed on 13 December 2018.

13 December 2018

a. Loose general refuse was observed on Bridge D15. Subsequently, the generela refuse was cleared. The observation was closed on 17 December 2018.

17 December 2018

a. Fugitive dust was observed when vehicle passing by the haul road between Bridge D9 and Bridge D12. Subsequently, water spraying was provided on the haul road. The observation was closed on 27 December 2018.

b. Excavator without provision of valid NRMM label was observed. Subsequently, valid NRMM label was provided. The observation was closed on 27 December 2018.

c. Accumulation of general refuse was observed in the vicinity of wheel-washing facilities. Subsequently, the general refuse was cleared. The observation was closed on 27 December 2018.

27 December 2018

a. Accumulation of stagnant water was observed on site. Subsequently, the stagnant water was cleared. The observation was closed on 2 January 2019.

2 January 2019

a. Loose general refuse has been observed near Bridge D9c. Subsequently, the general refuse was cleared. The observation was closed on 9 January 2019.

b. The NRMM label with faded colour was observed on the excavator. Subsequently, the new NRMM label was provided and the excavator was removed from site. The observation was closed on 9 January 2019.

9 January 2019

a. Loose general refuse was observed near P1203 area. Subsequently, the general refuse was cleared. The observation was closed on 16 January 2019.

16 January 2019

a. A chemical container without drip tray was observed near P913 area. Subsequently, the chemical container was removed from site. The observation was closed on 21 January 2019.

b. Dust emission was observed near the stockpile area. Subsequently, water spraying was provided near the stockpile area to minimise dust emission. The observation was closed on 21 January 2019.

21 January 2019

a. Accumulation of general refuse was observed near P913 area. Subsequently, the general refuse was cleared. The observation was closed on 30 January 2019.

b. Accumulation of stockpiles was observed near P1202 area. Subsequently, water spray was provided for accumulated stockpiles near P1202 area. The observation was closed on 30 January 2019.

30 January 2019

a. Some chemical containers near RW16S were place on the ground without suitable bund or drip tray. Subsequently, the chemical continaers were removed. The observation was closed on 8 February 2019.

b. Part of an access road near RW16N was observed as dry. Subsequently, water spraying was provided on the access road. The observation was closed on 8 February 2019.

8 February 2019

a. The excavator with faded out NRMM label was observed near P1202 area. Subsequently, NRMM label was observed on the excavator. The observation was closed on 13 February 2019.

13 February 2019

a. Oil stain and refuse were found near RW16S on the ground. Subsequently, the oil stain and refuse were cleared. The observation was closed on 20 February 2019.

20 February 2019

a. Loose general refuse was observed near RW16S. Subsequently, the general refuse was cleared. The observation was closed on 25 February 2019.

25 February 2019

a. No new observations were made.

Appendix G. Waste Flow Table

Name of Department: Highways Department

Contract No.: HY/2013/04

Monthly Summary Waste Flow Table for 2018

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^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	0	0	0	0	0	0	0	0	0	0	0.1293
Feb	0	0	0	0	0	0	0	0	0	0.2	0.1397
Mar	0	0	0	0	0	0	0	0	0	0	0.1346
Apr	0	0	0	0	0	0	0	0	0	0	0.2334
May	0	0	0	0	0	0	0	0	0	0	0.1748
Jun	0	0	0	0	0	0	0	0	0	0	0.2044
Sub-total	0.000	0	0	0.000	0	0	0	0	0	0.2	1.0162
Jul	0	0	0	0	0	0	0	0	0	0	0.2036
Aug	0	0	0	0	0	0	0	0	0	0	0.2856
Sep	0	0	0	0	0	0	0	0	0	0	0.2044
Oct	0	0	0	0	0	0	0	0	0	0	0.2183
Nov	5.324	0	0	0	5.324	0	0	0	0	0	0.1643
Dec	8.315	0	0	0	8.315	0	0	0	0	0	0.0880
Total	13.639	0	0	0.000	13.6389	0	0	0	0	0.2	2.1804

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

Name of Department: Highways Department

Contract No.: HY/2013/04

Monthly Summary of Excavated Marine Sediment for 2018

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^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)
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	0	0	0	0	0
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.

Name of Department: Highways Department

Contract No.: HY/2013/04

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^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan	4.274	0	0	0	4.274	0	0	0	0	0	0.1046
Feb	0.993	0	0	0	0.993	0	0	0	0	0	0.0864
Mar											
Apr											
May											
Jun											
Sub-total	5.267	0	0	0.000	5.2667	0	0	0	0	0	0.1910
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	5.267	0	0	0.000	5.267	0	0	0	0	0	0.1910

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

Name of Department: Highways Department

Contract No.: HY/2013/04

Monthly Summary of Excavated Marine Sediment for 2019

Month	a. Estimated Volume of Excavated Marine Sediment Generated	b. Estimate Volume of Accumulated Excavated Marine Sediment Treated	c. Reused in the Contract	d. Estimated Volume of Excavated Marine Sediment Transported to Other Projects (Note 1)	e. Estimated Volume of Treated Excavated Marine Sediment Stored on Site (Unused)
	(in m^3)	(in m^3)	(in m^3)	(in m^3)	(in m^3)
Jan	0	0	0	0	0
Feb	0	0	0	0	0
Mar					
Apr					
May					
Jun					
Sub-total	0	0	0	0	0
Jul					
Aug					
Sep					
Oct					
Nov					
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-RS0974-18	10 Oct 2018	31 Oct 2018	29 Mar 2019	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. Impact 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

Quarterly Progress Report (December 2018-February 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 April 2019

1. Introduction

1.1. For the Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong Boundary Crossing Facilities (HKBCF), the construction of the Infrastructure Works Stage II (Southern Portion) requires the contractor (i.e. China State Construction Engineering (Hong Kong) Limited) and the associated Environmental Team (ET), Mott MacDonald Hong Kong Limited, to implement the Environmental Monitoring and Audit (EM&A) programme.

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 construction-phase monitoring surveys have been undertaken by the HKLR03 project in the same areas (i.e. NWL and NEL), a combined monitoring approach is recommended by the Highways Department, that the HKBCF EM&A project should utilize the monitoring data collected by HKLR03 project to avoid any redundancy in monitoring effort.

1.3. In October 2018, the Director of Hong Kong Cetacean Research Project (HKCRP), Dr. Samuel Hung, has been appointed by the ET as the dolphin specialist for 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 project to examine any potential impacts of HKBCF constructions works 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 construction-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 December 2018 to February 2019 utilizing the data collected through the HKLR03 Contract No. HY/2011/03. 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. On the contrary, the previous monitoring data collected under HZMB HKBCF-Reclamation Works contract (Contract No. HY/2010/02) was from a different survey team that have adopted different survey methodology (e.g. two observers and one data recorder under HKBCF-Reclamation Works contract, as compared to one primary observer and one data recorder adopted by HKCRP team in the past 20+ years). Therefore, we cannot ensure that such monitoring data from that contract can be directly comparable to the HKLR03 monitoring data, and would rather use the previous HZMB monitoring data collected by HKCRP team instead for direct comparison with the present quarterly findings.

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 construction 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
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 HKCRP survey team 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^{o} and 90^{o} (in relation to the bow, which is defined as 0^{o}). 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 impact phase monitoring period were plotted onto 1-km^2 grids among NWL and NEL survey areas on GIS. Sighting densities (number of on-effort sightings per km^2) and dolphin densities (total number of dolphins from on-effort sightings per km^2) 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 **s**ightings **p**er 100 units of **s**urvey **e**ffort. In addition, the derived unit for actual dolphin density was termed DPSE, representing the number of **d**olphins **p**er 100 units of **s**urvey **e**ffort. Among the 1-km^2 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^2 grid within the study area:

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

DPSE = ((D / E) x 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 3-month impact phase 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© 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 contract during the period of December 2018 to February 2019, to cover all transect lines in NWL and NEL survey areas twice per month. From these surveys, 801.7 km of total survey effort was collected, and 94.7% 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, 302.1 km and 499.6 km of survey effort were collected respectively.

3.1.2. Moreover, 580.0 km of survey effort was conducted on primary lines, while another 221.7

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 as on-effort survey data. A summary table of the survey effort for the three-month period is shown in Appendix I.

3.1.3. From December 2018 to February 2019, 12 groups of 38 Chinese White Dolphins were sighted during the HKLR03 monitoring surveys, and the summary table of dolphin sightings is shown in Appendix II. Ten of the 12 groups were sighted during on-effort search, and eight of the ten 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 12 dolphin groups being sighted during the monitoring surveys conducted between December 2018 and February is shown in Figure 1. All 12 sightings were made at the western portion of the North Lantau region, with slightly higher concentration near Lung Kwu Chau. On the contrary, no dolphin was sighted at all in the central and eastern portions of the North Lantau region (Figure 1). The 12 groups were sighted very far away from the HKBCF and HKLR03 reclamation sites, as well as the bridge alignment of Tuen Mun-Chek Lap Kok Link (TMCLKL). However, two groups were sighted adjacent to the HKLR09 alignment near Shum Wat (Figure 1).

3.2.2. A comparison of dolphin distribution between the present impact phase period and the baseline monitoring period (September-November 2011) revealed considerable differences. For example, in NEL dolphin was not found during the survey in the present quarter but in the baseline survey they were frequently found in the same study area, including the waters near Shum Shui Kok and in the vicinity of the HKBCF reclamation site (Figure 1). Furthermore, dolphins were infrequently sighted in NWL waters and mainly at the western end of the survey area 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 impact 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).

Table 2. Dolphin encounter rates (sightings per 100 km of survey effort) during December 2018 to February 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 (3 & 5 Dec 2018)	0.0	0.0
	Set 2 (10 & 12 Dec 2018)	0.0	0.0
	Set 3 (2 & 3 Jan 2019)	0.0	0.0
	Set 4 (7 & 14 Jan 2019)	0.0	0.0
	Set 5 (1 & 14 Feb 2019)	0.0	0.0
	Set 6 (20, 25 & 26 Feb 2019)	0.0	0.0
Northwest Lantau	Set 1 (3 & 5 Dec 2018)	4.0	11.9
	Set 2 (10 & 12 Dec 2018)	0.0	0.0
	Set 3 (2 & 3 Jan 2019)	3.3	15.0
	Set 4 (7 & 14 Jan 2019)	0.0	0.0
	Set 5 (1 & 14 Feb 2019)	3.9	7.7
	Set 6 (20, 25 & 26 Feb 2019)	3.3	13.2

Table 3. Comparison of average dolphin encounter rates from impact monitoring period (December 2018-February 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; ± 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)	
	December 2018 – February 2019	September – November 2011	December 2018 – February 2019	September – November 2011
Northeast Lantau	0.00	6.0 ± 5.05	0.0	22.2 ± 26.81
Northwest Lantau	2.4 ± 1.88	9.9 ± 5.85	8.0 ± 6.60	44.7 ± 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 2.2 sightings and 7.1 dolphins per 100 km of survey effort respectively for this quarter.

3.3.3. For the present three-month impact 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 winter quarters throughout the HZMB monitoring period (Table 4).

Table 4. Comparison of average dolphin encounter rates in Northeast Lantau survey area from the same winter quarters of HKLR03 and HKBCF impact 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; ± 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 2011 (Baseline)	**6.0 ± 5.05**	**22.2 ± 26.81**
December 2012-February 2013 (HKLR03 Impact*)	3.1 ± 3.21	6.3 ± 8.64
December 2013-February 2014 (HKLR03 Impact*)	0.5 ± 1.10	1.3 ± 3.29
December 2014-February 2015 (HKLR03 Impact*)	0.0	0.0
December 2015-February 2016 (HKLR03 Impact*)	0.0	0.0
December 2016-February 2017 (HKLR03 Impact*)	0.0	0.0
December 2017-February 2018 (HKLR03 Impact*)	0.0	0.0
December 2018-February 2019 (HKBCF Impact)	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 impact monitoring period

3.3.4. On the other hand, the average dolphin encounter rates (STG and ANI) in NWL during the present impact phase monitoring period were only small fractions of the ones recorded during the three-month baseline period (with reductions of 75.8% and 82.1% respectively), indicating a noticeable decline in dolphin usage of this survey area during the present impact phase period (Table 5).

Table 5. Comparison of average dolphin encounter rates in Northwest Lantau survey area from all winter quarters of HKLR03 and HKBCF impact 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; ± 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 2011 (Baseline)	**9.9 ± 5.85**	**44.7 ± 29.85**
December 2012-February 2013 (HKLR03 Impact*)	8.4 ± 5.03	35.9 ± 23.10
December 2013-February 2014 (HKLR03 Impact*)	8.2 ± 2.21	32.6 ± 11.21
December 2014-February 2015 (HKLR03 Impact*)	2.9 ± 2.69	11.3 ± 15.19
December 2015-February 2016 (HKLR03 Impact*)	2.6 ± 1.52	11.0 ± 3.81
December 2016-February 2017 (HKLR03 Impact*)	3.8 ± 3.79	14.5 ± 17.21
December 2017-February 2018 (HKLR03 Impact*)	4.8 ± 2.26	15.7 ± 15.94
December 2018-February 2019 (HKBCF Impact)	2.4 ± 1.88	8.0 ± 6.60

* 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 impact monitoring period

3.3.5. Both dolphin encounter rates in NWL in winter of 2018-19 were the lowest among all winter quarters during the HZMB monitoring period, and apparently after a slight rebound in the winter of 2016-17 and 2017-18, there was another noticeable drop in 2018-19 to the lowest point (Table 5). This is a very worrying trend as the dolphin occurrence should have recovered somewhat since the HKBCF reclamation works, which incurred permanent habitat loss, have been completed a few years ago and the remaining marine construction activities for the HKBCF are also nearly completed.

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 impact monitoring periods. The two variables that were examined included the two periods (baseline and impact 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 0.0041 and 0.0221 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. The significant decline in dolphin occurrence should raise serious concern, as the timing of the decline coincided well with the construction schedule of the HZMB related project as suggested by Hung (2018). Moreover, it is apparent that there has been no sign of recovery in dolphin usage, 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.

3.4. Group size

3.4.1. From December 2018 to February 2019, the group sizes of Chinese White Dolphins ranged from one to seven individuals per group in North Lantau region. The average dolphin group sizes from the present three-month 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 impact monitoring period (December 2018-February 2019) and baseline monitoring period (September-November 2011) (Note: ± denotes the standard deviation of average group size)

	Average Dolphin Group Size	
	December 2018 – February 2019	**September – November 2011**
Overall	3.2 ± 1.80 (n = 12)	3.7 ± 3.13 (n = 66)
Northeast Lantau	---	3.2 ± 2.16 (n = 17)
Northwest Lantau	3.2 ± 1.80 (n = 12)	3.9 ± 3.40 (n = 49)

3.4.2. During the present quarter, the average dolphin group size in NWL was lower than the one recorded during the baseline period. However, it should also be noted that the sample size in the present quarter (12 groups) was much smaller than the 66 groups sighted during the baseline period (Table 6).

3.4.3. With the exception of three medium-sized groups with 5-7 animals, the other nine dolphin groups were composed of small groups with 1-4 animals only (Appendix II). The three medium-sized groups were scattered at the mouth of Deep Bay, near Lung Kwu Tan and between Sha Chau and Lung Kwu Chau respectively (Figure 2). This is in 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 nine grids recorded dolphin occurrences, and the grids with moderately high densities were located near Lung Kwu Tan, between Sha Chau and Lung Kwu Chau, and to the north of the airport adjacent to the third runway expansion reclamation work site (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 impact phase 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 impact 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 impact phase period (Figure 4).

3.5.3. Moreover, the dolphin density patterns were also very different in NWL between the baseline and impact phase monitoring periods, with high usage throughout the area during the baseline period, while only several grids with moderate to high dolphin densities scattered in the western portion of North Lantau waters during the present impact phase period (Figure 4).

3.6. Mother-calf pairs

3.6.1. One mother-calf pair was sighted among the 12 dolphin groups during the present quarterly period, and the unspotted juvenile was spotted with its mother (WL145, a known individual from the photo-identification catalogue) at the southwest corner of NWL survey areas (Figure 5).

3.6.2. Such rare occurrence was in stark contrast to the regular occurrence of young calves with their mothers in North Lantau waters during the baseline period (Figure 5), which should be of a serious concern.

3.7. Activities and associations with fishing boats

3.7.1. Among the 12 groups sighted during the present quarterly period, two of them were

engaged in feeding activities, which was located to the north of the airport platform and adjacent to the HKLR09 alignment respectively (Figure 6). On the other hand, none of the groups was engaged in socializing, traveling or milling/resting activity.

3.7.2. When compared to the baseline period, distribution of various dolphin activities during the present quarterly period was drastically different with very rare occurrence of such activities (Figure 6).

3.7.3. It should also be noted that none of the 12 dolphin groups sighted during the present quarter was associated with any operating fishing vessels.

3.8. Summary of photo-identification works

3.8.1. Over 1,200 digital photographs of Chinese White Dolphins were taken from December 2018 to February 2019 for the photo-identification work during the HKLR03 surveys. A total of 16 individuals were identified and sighted 31 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. The majority of the 16 individuals were re-sighted only once or twice, but there were also five individuals being re-sighted 3-4 times during the quarterly period (Appendix III). Notably, only one of these individuals (NL259) sighted in NWL survey area during the HKLR03 monitoring surveys was also sighted in West Lantau waters during the HKLR09 monitoring surveys during the same quarterly period.

3.9. Individual range use

3.9.1. Ranging patterns of the 16 individuals identified during the three-month study period were determined by fixed kernel method, and are shown in Appendix V.

3.9.2. While all 16 individuals were sighted only in NWL waters in the present quarter, none of them occurred in NEL waters (Appendix V), which is 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 impact monitoring quarters. Moreover, only one individual (NL259) has extended its range use to WL waters, even though such movements between North and West Lantau waters were quite common in the past several years.

3.9.4. Individual range use and movements should be continuously examined in the upcoming quarters, to determine whether there has been any consistent shifts of individual home

ranges from North Lantau to West or Southwest Lantau, or vice versa.

4. Conclusion

4.1. During the present quarter of dolphin monitoring, no adverse impact from the activities of this construction project on Chinese White Dolphins was noticeable from general observations.

4.2. 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, and many individuals have shifted away from this once-important habitat for the dolphins.

4.3. It is critical to continuously monitor the dolphin usage in North Lantau region in the upcoming quarters, to determine whether the dolphins are continuously affected by the various construction activities in relation to the HZMB-related works, and whether there is any sign of recovery when the construction works have been completed.

5. References

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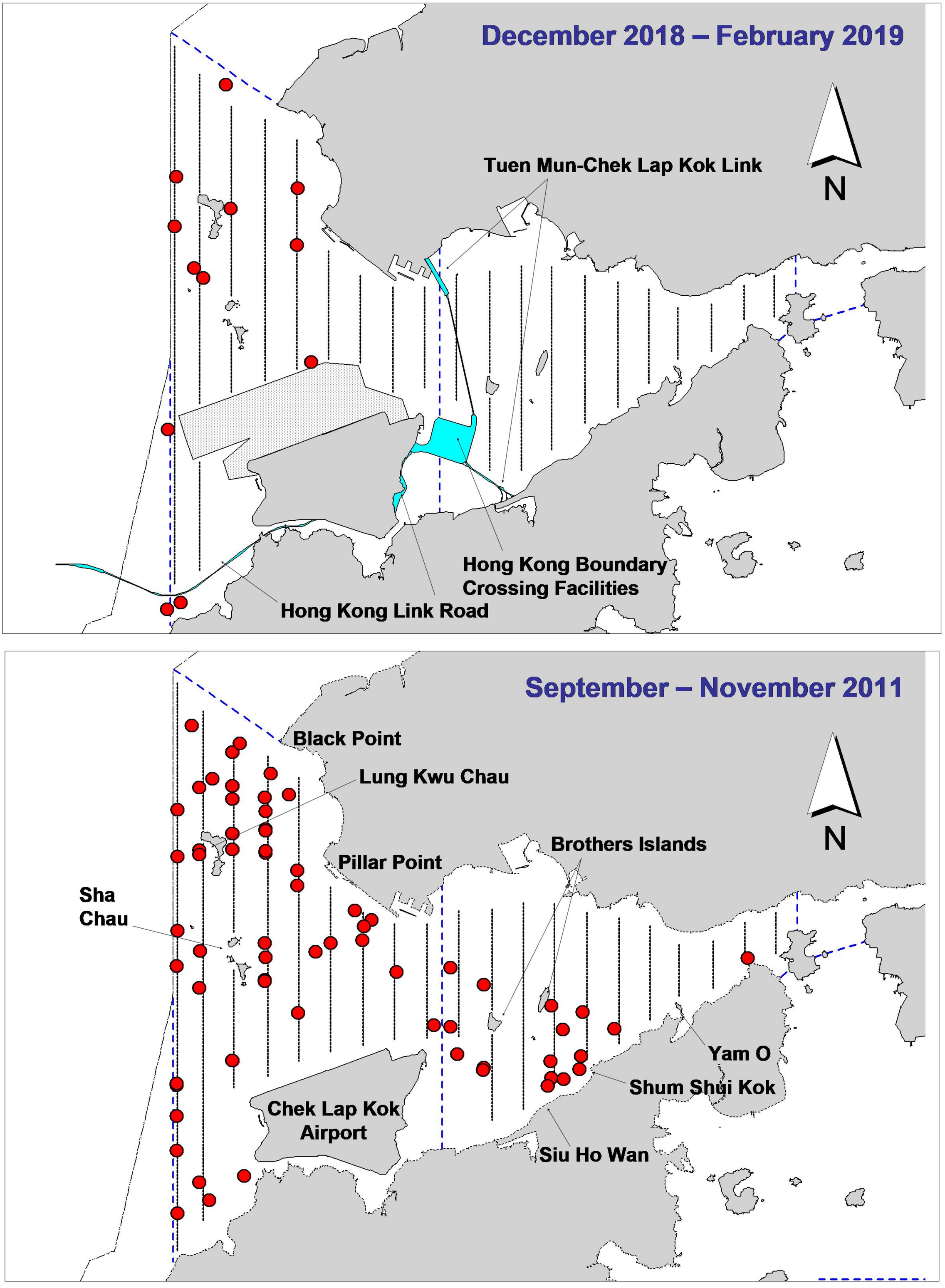


Figure 1. Distribution of Chinese white dolphin sighting in Northwest and Northeast Lantau during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

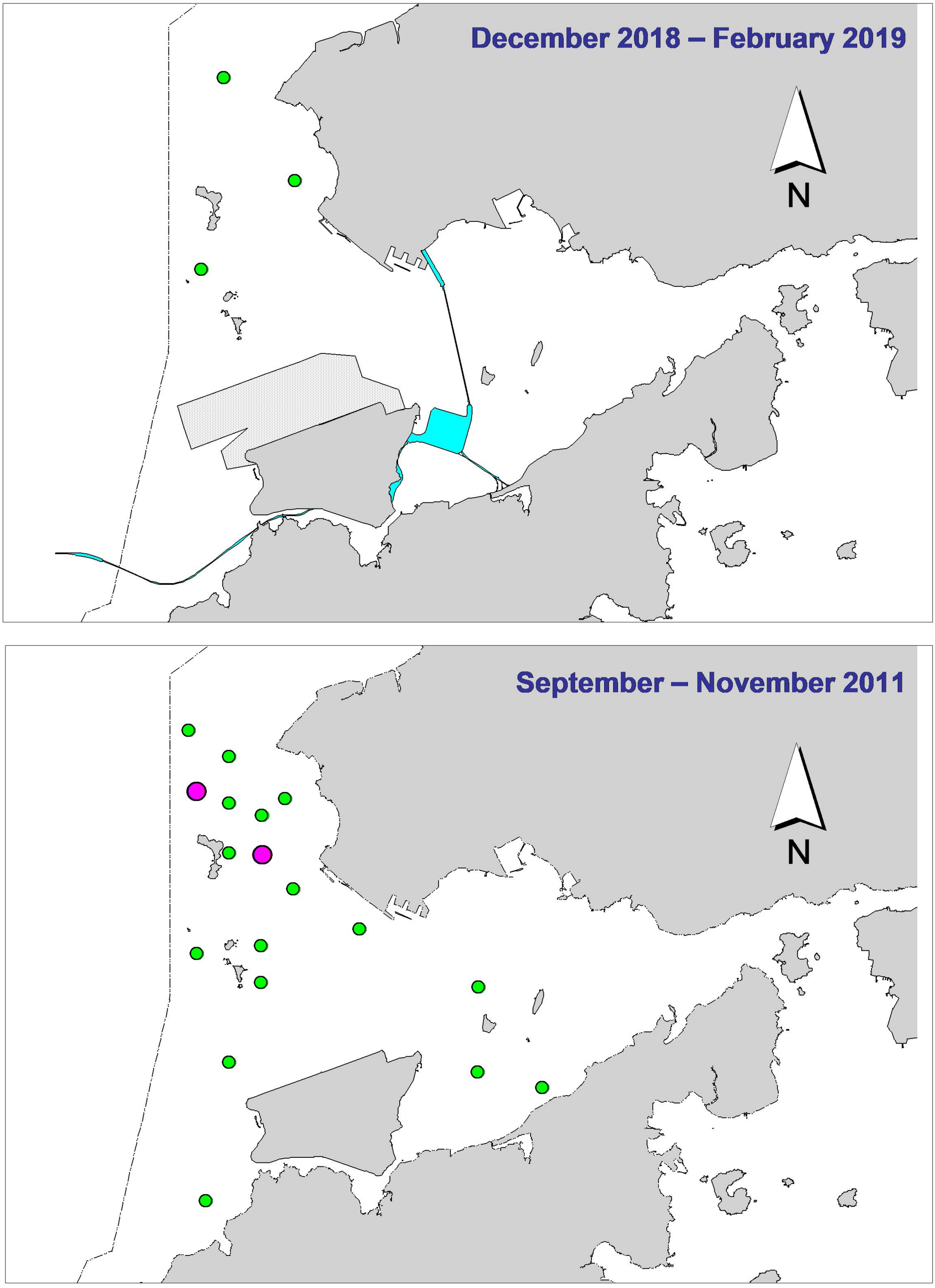


Figure 2. Distribution of Chinese white dolphins with larger group sizes during HKLR03 impact phase (top) and baseline monitoring surveys (bottom) (green dots: group sizes of 5 or more; purple dots: group sizes of 10 or more)

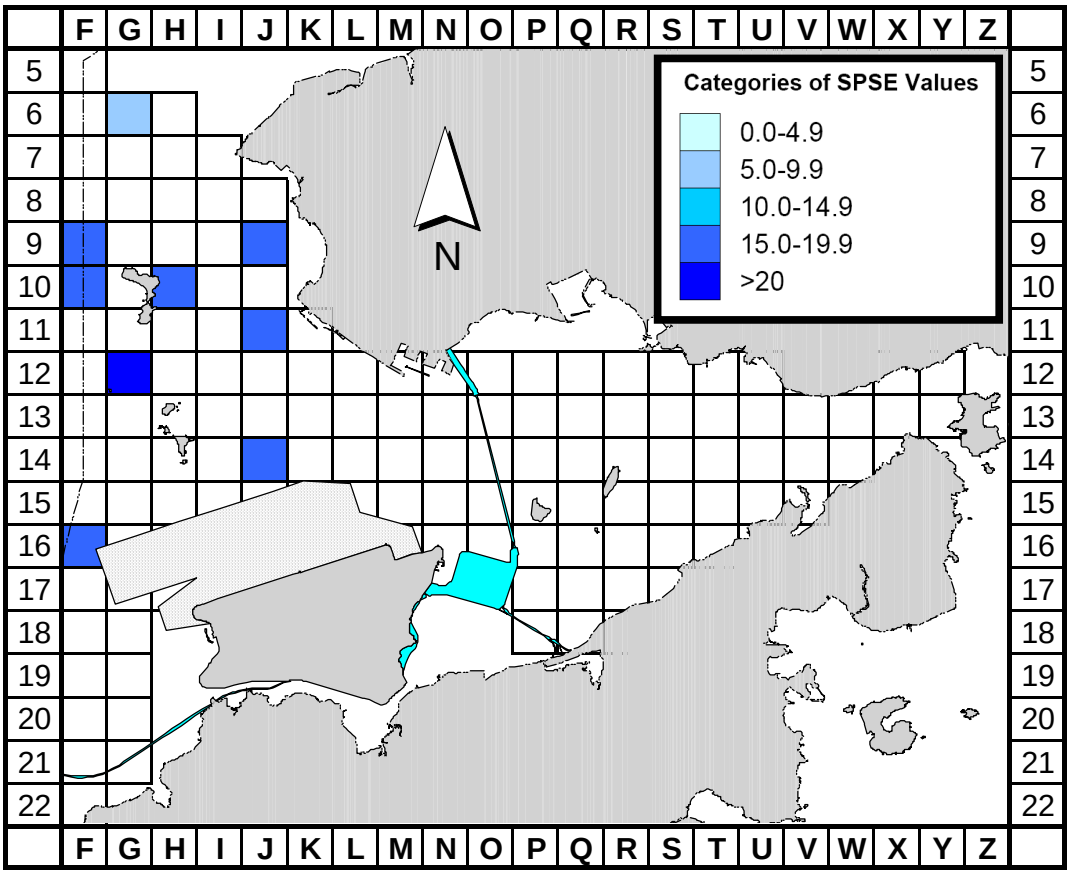


Figure 3a. Sighting density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period monitoring period (Dec 18-Feb 19) (SPSE = no. of on-effort sightings per 100 units of survey effort)

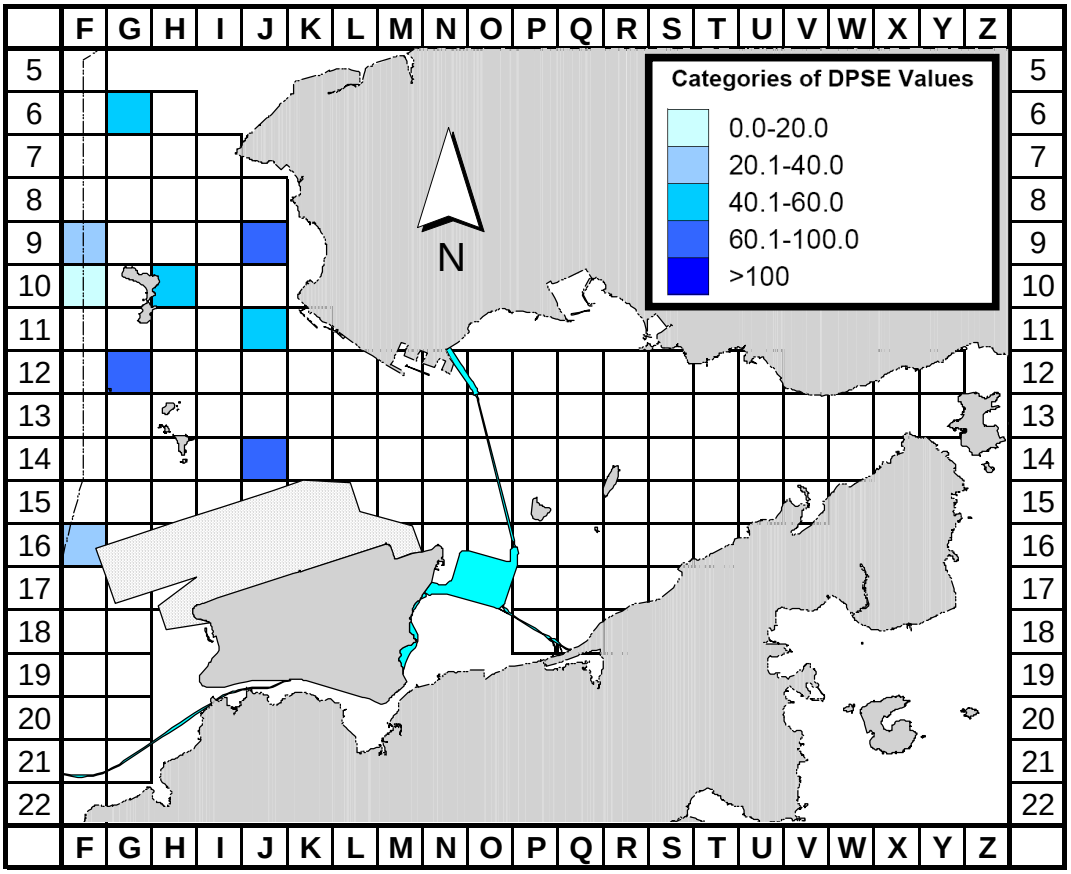


Figure 3b. Density of Chinese white dolphins with corrected survey effort per km^2 in Northeast and Northwest Lantau survey areas, using data collected during HKLR03 impact monitoring period (Dec 18-Feb 19) (DPSE = no. of dolphins per 100 units of survey effort)

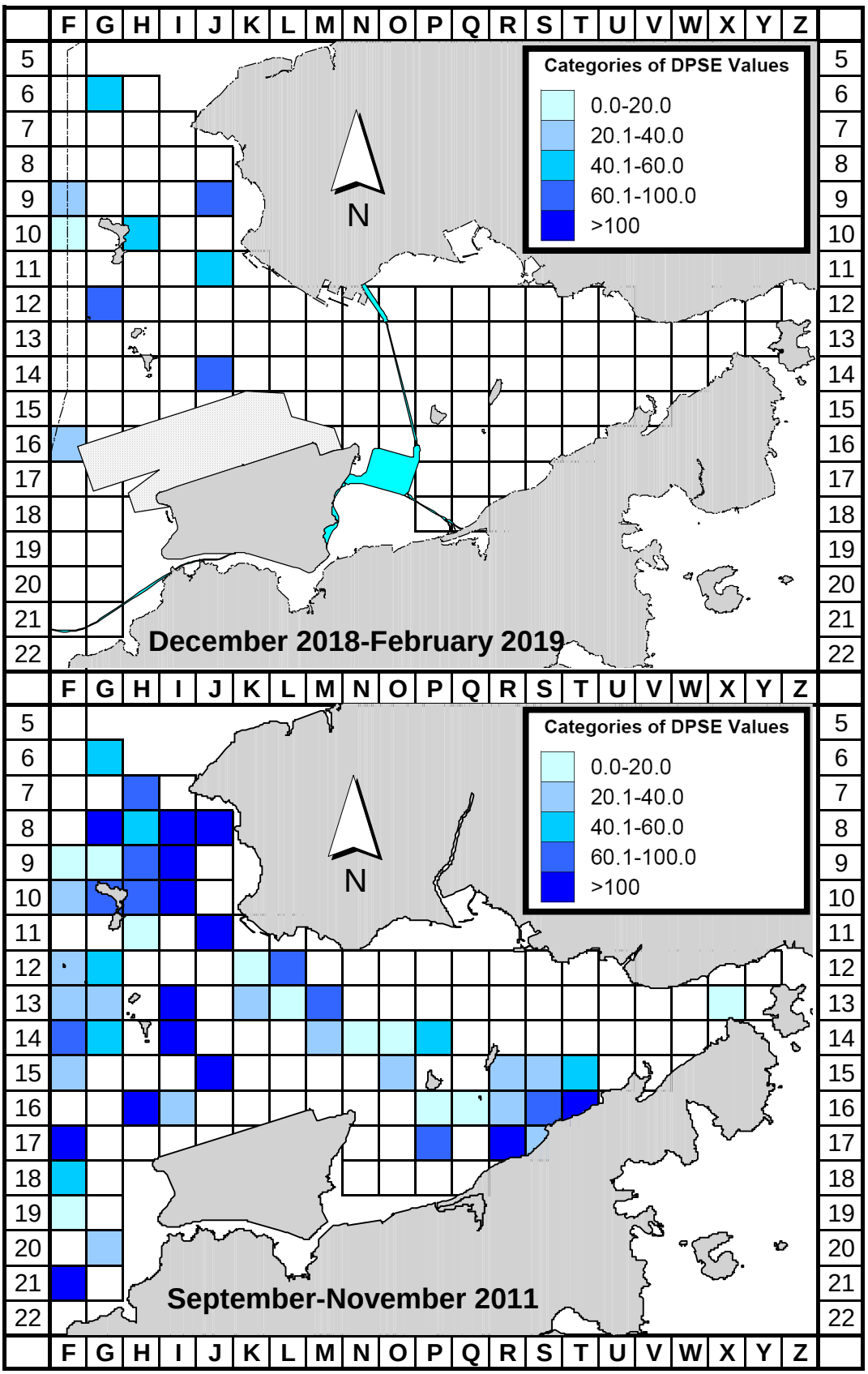


Figure 4. Comparison of density of Chinese white dolphins with corrected survey effort per km^2 in Northwest and Northeast Lantau survey area between the impact monitoring period (December 2018-February 2019) and baseline monitoring period (September-November 2011)
(DPSE = no. of dolphins per 100 units of survey effort)

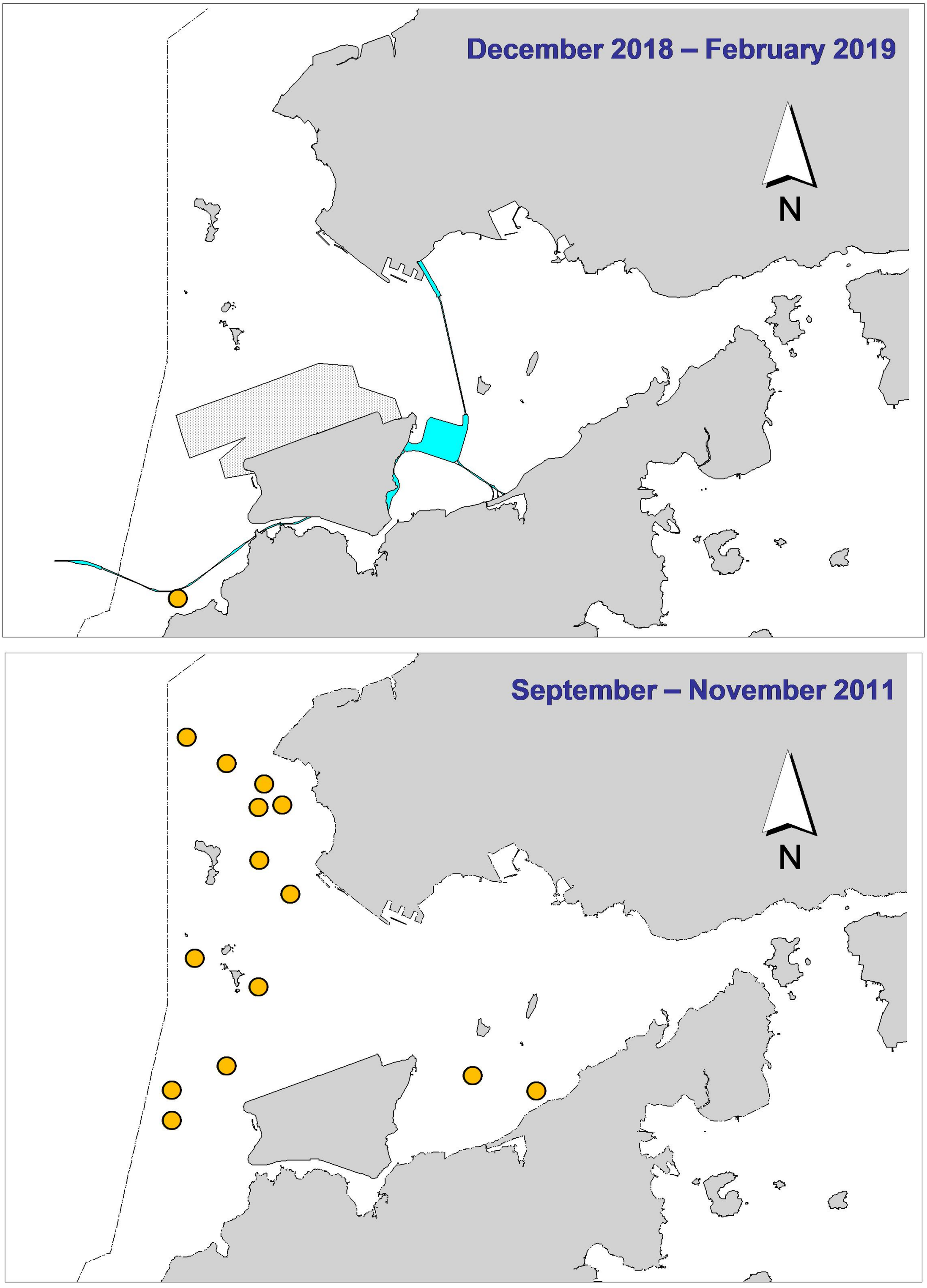


Figure 5. Distribution of young calves of Chinese white dolphins during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

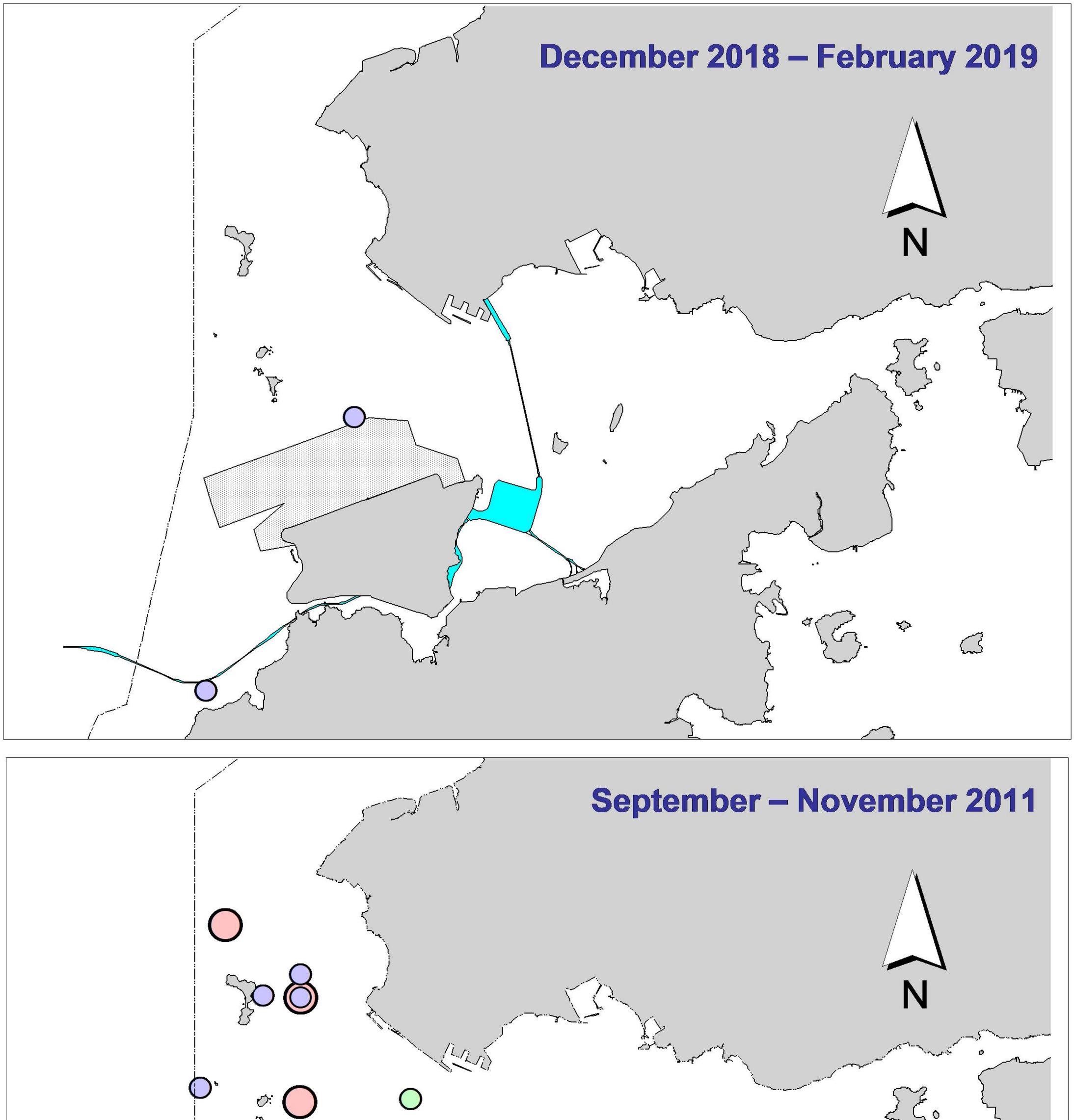


Figure 6. Distribution of Chinese white dolphins engaged in feeding (purple dots), socializing (pink dots) and traveling (green dots) activities during HKLR03 impact phase (top) and baseline monitoring surveys (bottom)

Appendix I. HKLR03 Survey Effort Database (December 2018-February 2019)

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

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
3-Dec-18	NW LANTAU	2	27.00	WINTER	STANDARD36826	HKLR	P
3-Dec-18	NW LANTAU	3	4.18	WINTER	STANDARD36826	HKLR	P
3-Dec-18	NW LANTAU	2	10.68	WINTER	STANDARD36826	HKLR	S
5-Dec-18	NW LANTAU	3	19.43	WINTER	STANDARD36826	HKLR	P
5-Dec-18	NW LANTAU	4	9.90	WINTER	STANDARD36826	HKLR	P
5-Dec-18	NW LANTAU	3	6.57	WINTER	STANDARD36826	HKLR	S
5-Dec-18	NW LANTAU	4	4.30	WINTER	STANDARD36826	HKLR	S
5-Dec-18	NE LANTAU	2	8.60	WINTER	STANDARD36826	HKLR	P
5-Dec-18	NE LANTAU	3	26.18	WINTER	STANDARD36826	HKLR	P
5-Dec-18	NE LANTAU	4	1.10	WINTER	STANDARD36826	HKLR	P
5-Dec-18	NE LANTAU	2	6.60	WINTER	STANDARD36826	HKLR	S
5-Dec-18	NE LANTAU	3	6.22	WINTER	STANDARD36826	HKLR	S
10-Dec-18	NW LANTAU	2	13.34	WINTER	STANDARD36826	HKLR	P
10-Dec-18	NW LANTAU	3	22.85	WINTER	STANDARD36826	HKLR	P
10-Dec-18	NW LANTAU	2	8.98	WINTER	STANDARD36826	HKLR	S
10-Dec-18	NW LANTAU	3	1.73	WINTER	STANDARD36826	HKLR	S
12-Dec-18	NW LANTAU	2	7.60	WINTER	STANDARD36826	HKLR	P
12-Dec-18	NW LANTAU	3	10.12	WINTER	STANDARD36826	HKLR	P
12-Dec-18	NW LANTAU	4	7.55	WINTER	STANDARD36826	HKLR	P
12-Dec-18	NW LANTAU	2	2.10	WINTER	STANDARD36826	HKLR	S
12-Dec-18	NW LANTAU	3	6.10	WINTER	STANDARD36826	HKLR	S
12-Dec-18	NW LANTAU	4	2.53	WINTER	STANDARD36826	HKLR	S
12-Dec-18	NE LANTAU	2	33.02	WINTER	STANDARD36826	HKLR	P
12-Dec-18	NE LANTAU	3	2.59	WINTER	STANDARD36826	HKLR	P
12-Dec-18	NE LANTAU	2	12.69	WINTER	STANDARD36826	HKLR	S
2-Jan-19	NW LANTAU	2	5.20	WINTER	STANDARD36826	HKLR	P
2-Jan-19	NW LANTAU	3	23.70	WINTER	STANDARD36826	HKLR	P
2-Jan-19	NW LANTAU	2	5.40	WINTER	STANDARD36826	HKLR	S
2-Jan-19	NW LANTAU	3	3.96	WINTER	STANDARD36826	HKLR	S
2-Jan-19	NW LANTAU	4	2.14	WINTER	STANDARD36826	HKLR	S
2-Jan-19	NE LANTAU	2	17.54	WINTER	STANDARD36826	HKLR	P
2-Jan-19	NE LANTAU	3	17.80	WINTER	STANDARD36826	HKLR	P
2-Jan-19	NE LANTAU	2	8.76	WINTER	STANDARD36826	HKLR	S
2-Jan-19	NE LANTAU	3	5.80	WINTER	STANDARD36826	HKLR	S
3-Jan-19	NW LANTAU	2	31.36	WINTER	STANDARD36826	HKLR	P
3-Jan-19	NW LANTAU	2	11.88	WINTER	STANDARD36826	HKLR	S
7-Jan-19	NW LANTAU	2	21.80	WINTER	STANDARD36826	HKLR	P
7-Jan-19	NW LANTAU	3	10.90	WINTER	STANDARD36826	HKLR	P
7-Jan-19	NW LANTAU	2	2.20	WINTER	STANDARD36826	HKLR	S
7-Jan-19	NW LANTAU	3	9.60	WINTER	STANDARD36826	HKLR	S
7-Jan-19	NE LANTAU	2	35.83	WINTER	STANDARD36826	HKLR	P
7-Jan-19	NE LANTAU	2	12.07	WINTER	STANDARD36826	HKLR	S
14-Jan-19	NW LANTAU	2	26.88	WINTER	STANDARD36826	HKLR	P
14-Jan-19	NW LANTAU	2	13.92	WINTER	STANDARD36826	HKLR	S
1-Feb-19	NW LANTAU	2	6.59	WINTER	STANDARD36826	HKLR	P
1-Feb-19	NW LANTAU	3	20.70	WINTER	STANDARD36826	HKLR	P
1-Feb-19	NW LANTAU	4	5.70	WINTER	STANDARD36826	HKLR	P
1-Feb-19	NW LANTAU	1	1.06	WINTER	STANDARD36826	HKLR	S
1-Feb-19	NW LANTAU	2	5.60	WINTER	STANDARD36826	HKLR	S
1-Feb-19	NW LANTAU	3	4.30	WINTER	STANDARD36826	HKLR	S

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
1-Feb-19	NE LANTAU	1	2.60	WINTER	STANDARD36826	HKLR	P
1-Feb-19	NE LANTAU	2	33.86	WINTER	STANDARD36826	HKLR	P
1-Feb-19	NE LANTAU	1	2.30	WINTER	STANDARD36826	HKLR	S
1-Feb-19	NE LANTAU	2	10.14	WINTER	STANDARD36826	HKLR	S
14-Feb-19	NW LANTAU	2	11.58	WINTER	STANDARD36826	HKLR	P
14-Feb-19	NW LANTAU	3	12.95	WINTER	STANDARD36826	HKLR	P
14-Feb-19	NW LANTAU	4	3.30	WINTER	STANDARD36826	HKLR	P
14-Feb-19	NW LANTAU	2	1.76	WINTER	STANDARD36826	HKLR	S
14-Feb-19	NW LANTAU	3	7.76	WINTER	STANDARD36826	HKLR	S
20-Feb-19	NW LANTAU	2	15.35	WINTER	STANDARD36826	HKLR	P
20-Feb-19	NW LANTAU	3	12.38	WINTER	STANDARD36826	HKLR	P
20-Feb-19	NW LANTAU	2	7.25	WINTER	STANDARD36826	HKLR	S
20-Feb-19	NW LANTAU	3	5.06	WINTER	STANDARD36826	HKLR	S
25-Feb-19	NW LANTAU	2	27.52	WINTER	STANDARD36826	HKLR	P
25-Feb-19	NW LANTAU	3	5.53	WINTER	STANDARD36826	HKLR	P
25-Feb-19	NW LANTAU	2	11.35	WINTER	STANDARD36826	HKLR	S
25-Feb-19	NE LANTAU	1	4.41	WINTER	STANDARD36826	HKLR	P
25-Feb-19	NE LANTAU	2	15.20	WINTER	STANDARD36826	HKLR	P
25-Feb-19	NE LANTAU	1	6.35	WINTER	STANDARD36826	HKLR	S
25-Feb-19	NE LANTAU	2	5.24	WINTER	STANDARD36826	HKLR	S
26-Feb-19	NE LANTAU	3	12.70	WINTER	STANDARD36826	HKLR	P
26-Feb-19	NE LANTAU	4	3.51	WINTER	STANDARD36826	HKLR	P
26-Feb-19	NE LANTAU	5	1.64	WINTER	STANDARD36826	HKLR	P
26-Feb-19	NE LANTAU	3	8.80	WINTER	STANDARD36826	HKLR	S
26-Feb-19	NE LANTAU	4	0.55	WINTER	STANDARD36826	HKLR	S

Appendix II. HKLR03 Chinese White Dolphin Sighting Database (December 2018-February 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
3-Dec-18	1	1046	5	NW LANTAU	2	821	ON	HKLR	827178	808517	WINTER	NONE	P
3-Dec-18	2	1247	1	NW LANTAU	3	962	ON	HKLR	826056	804663	WINTER	NONE	P
3-Jan-19	1	1151	7	NW LANTAU	2	614	ON	HKLR	830239	806267	WINTER	NONE	P
3-Jan-19	2	1234	2	NW LANTAU	2	71	ON	HKLR	827529	804728	WINTER	NONE	P
14-Jan-19	1	1319	2	NW LANTAU	2	ND	OFF	HKLR	814949	804866	WINTER	NONE	N/A
14-Jan-19	2	1336	3	NW LANTAU	2	ND	OFF	HKLR	814739	804443	WINTER	NONE	N/A
1-Feb-19	1	1233	3	NW LANTAU	3	219	ON	HKLR	825495	808493	WINTER	NONE	P
14-Feb-19	1	1024	2	NW LANTAU	3	341	ON	HKLR	820043	804465	WINTER	NONE	S
14-Feb-19	2	1102	1	NW LANTAU	3	197	ON	HKLR	824826	805278	WINTER	NONE	P
14-Feb-19	3	1356	4	NW LANTAU	3	82	ON	HKLR	822050	808930	WINTER	NONE	S
20-Feb-19	1	1220	5	NW LANTAU	3	878	ON	HKLR	824548	805556	WINTER	NONE	P
25-Feb-19	1	1146	3	NW LANTAU	2	147	ON	HKLR	826584	806435	WINTER	NONE	P

Appendix III. Individual dolphins identified during HKLR03 monitoring surveys in December 2018 - February 2019

ID#	DATE	STG#	AREA
CH34	03/12/18	1	NW LANTAU
	03/01/19	1	NW LANTAU
	20/02/19	1	NW LANTAU
	25/02/19	1	NW LANTAU
NL33	03/01/19	1	NW LANTAU
	14/01/19	2	NW LANTAU
NL98	03/01/19	2	NW LANTAU
	25/02/19	1	NW LANTAU
NL123	01/02/19	1	NW LANTAU
	14/02/19	3	NW LANTAU
	20/02/19	1	NW LANTAU
NL136	03/01/19	1	NW LANTAU
	20/02/19	1	NW LANTAU
	25/02/19	1	NW LANTAU
NL182	03/12/18	1	NW LANTAU
	03/01/19	1	NW LANTAU
	01/02/19	1	NW LANTAU
NL202	03/12/18	2	NW LANTAU
	03/01/19	1	NW LANTAU
	01/02/19	1	NW LANTAU
	20/02/19	1	NW LANTAU
NL259	14/01/19	2	NW LANTAU
NL321	14/02/19	3	NW LANTAU
NL322	03/01/19	1	NW LANTAU
	14/01/19	2	NW LANTAU
NL331	14/02/19	1	NW LANTAU
WL17	14/02/19	3	NW LANTAU
WL98	14/01/19	1	NW LANTAU
WL243	14/02/19	1	NW LANTAU
WL273	03/01/19	1	NW LANTAU
WL281	20/02/19	1	NW LANTAU

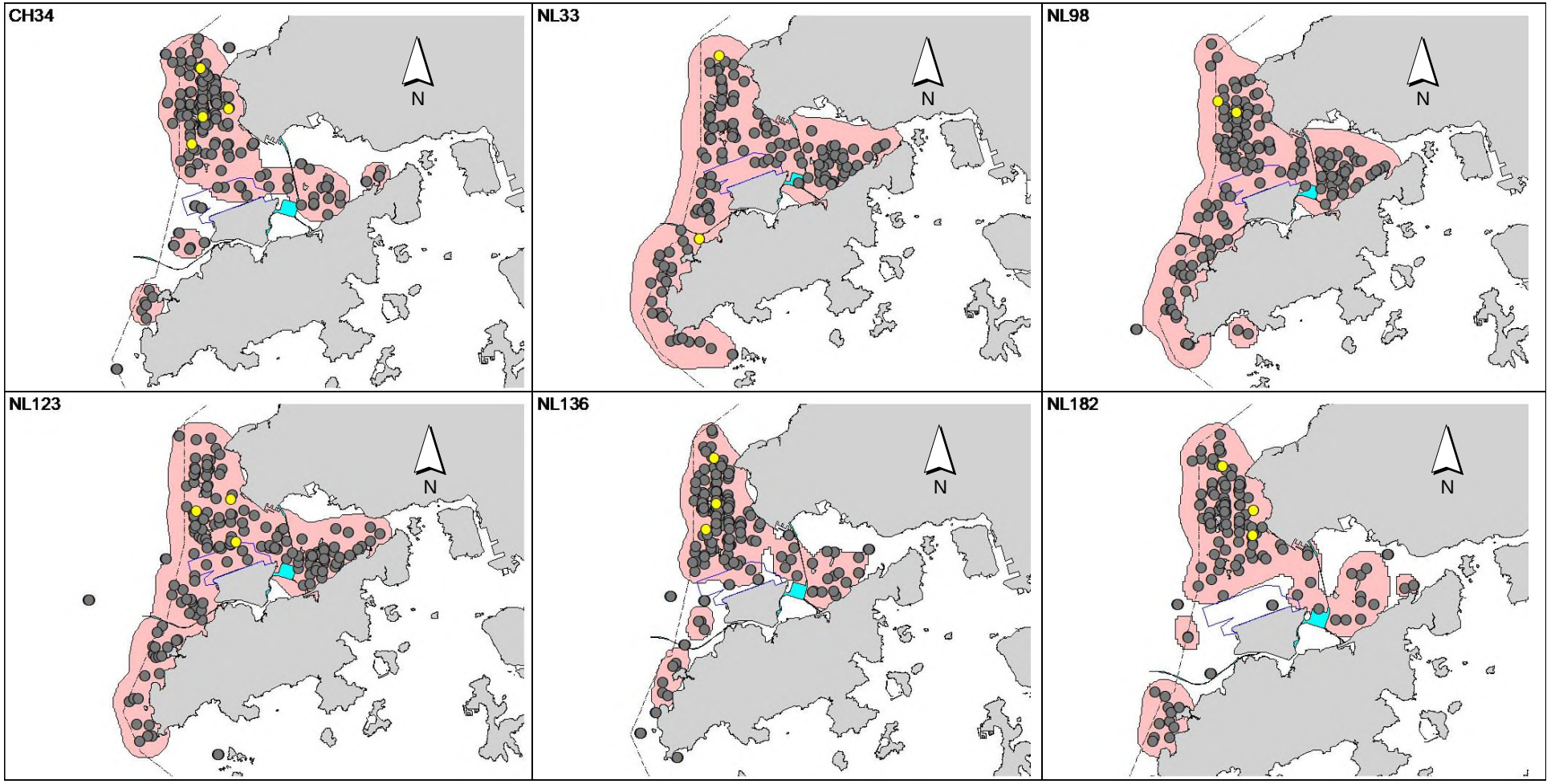
Appendix IV. Sixteen individual dolphins that were identified during December 2018 to February 2019 under HKLR03 impact phase monitoring surveys

Appendix IV. (cont'd)

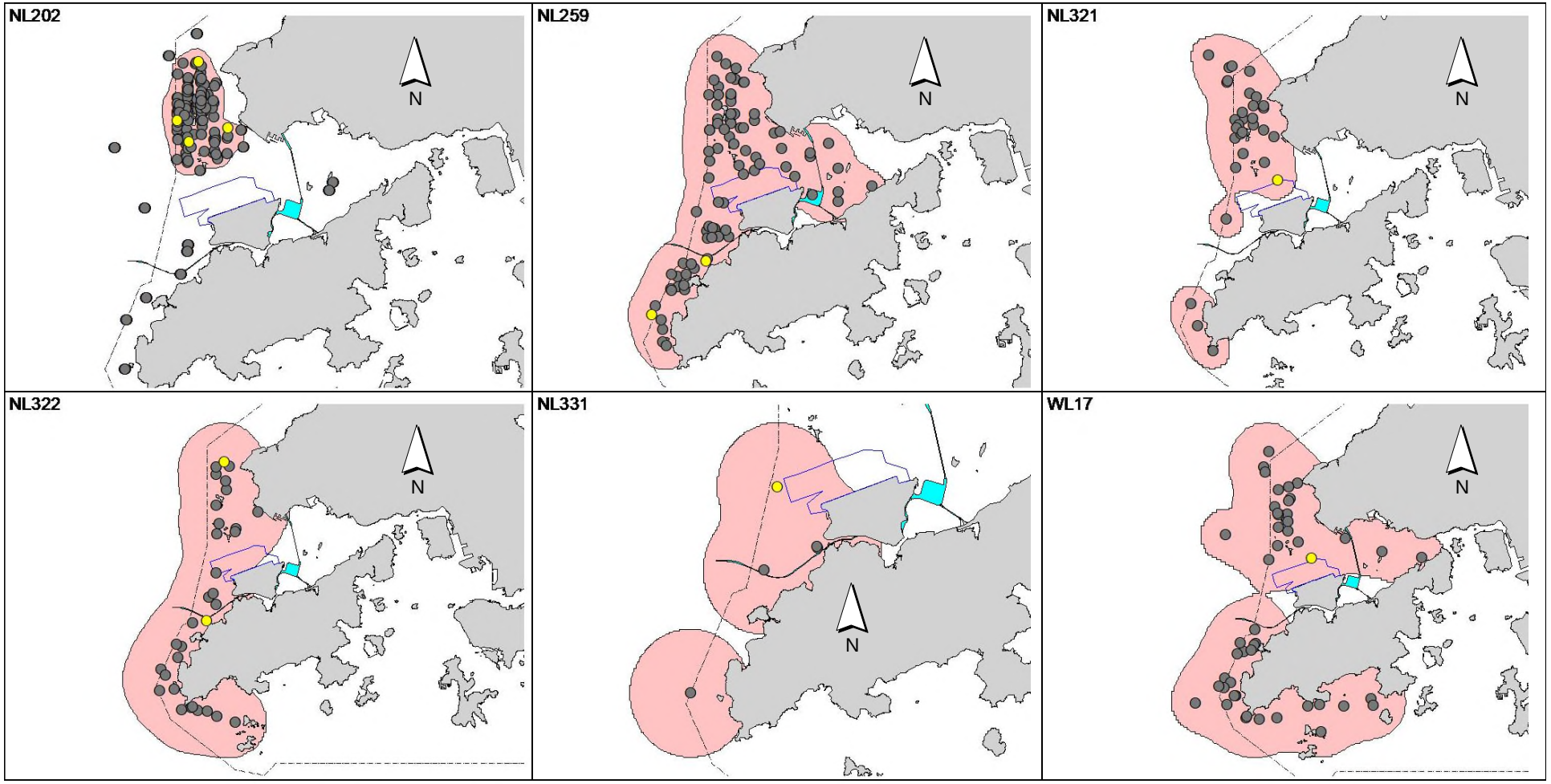
Appendix IV. (cont'd)

Appendix IV. (cont'd)

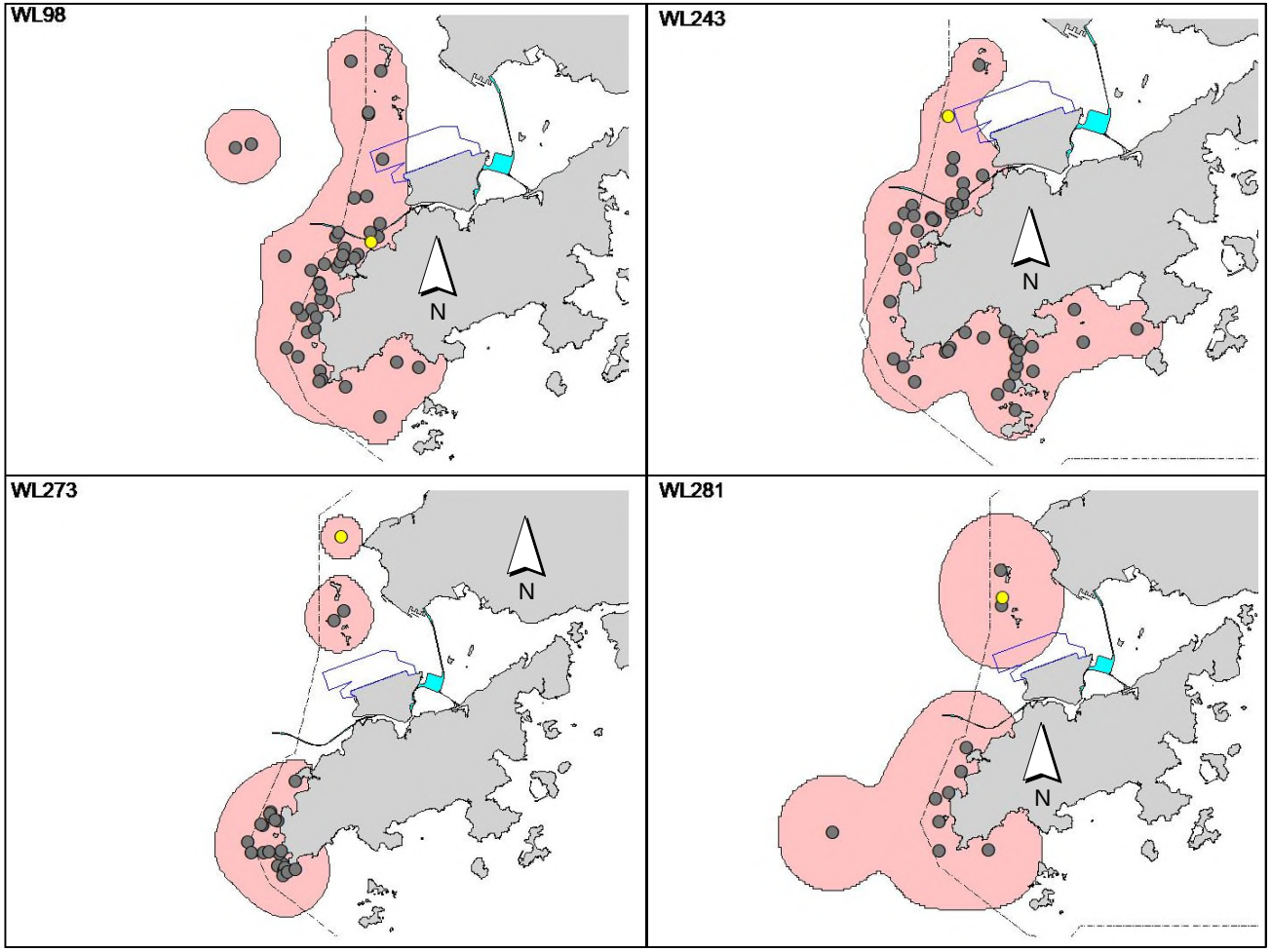
Appendix V. Ranging patterns (95% kernel ranges) of 16 individual dolphins that were sighted during HKLR03 impact phase monitoring period (note: yellow dots indicate sightings made in Dec 2018 – Feb 2019 during HKLR03 and HKLR09 monitoring surveys)



Appendix V. (cont'd)



Appendix V. (cont'd)



Appendix K. Incident Report on Action Level or Limit Level Non-compliance

Incident Report on Action Level or Limit Level Non-compliance

<table>
<tr><td>Contract</td><td>Contract No. HY/2013/04
HZMB HKBCF – Infrastructure Works Stage II (Southern Portion)</td></tr>
<tr><td>Ref. No.</td><td>E101</td></tr>
<tr><td>Date</td><td>December 2018 – February 2019 (referred to as the “reporting period”)</td></tr>
<tr><td>Time (hh:mm)</td><td>N/A</td></tr>
<tr><td>Monitoring Location</td><td>Northeast Lantau (NEL) & Northwest Lantau (NWL)</td></tr>
<tr><td>Parameter</td><td>Ecology – Chinese White Dolphin (CWD)</td></tr>
<tr><td>Action Level
Limit Level</td><td>The Action and Limit Levels of CWD monitoring extracted from the enhanced Event and Action Plan for CWD Monitoring (as accepted by EPD on 7 May 2013) are reproduced below.</td></tr>
<tr><td>Measured Level</td><td>
<table>
<tr><td></td><td colspan="2">Action & Limit Levels (AL & LL):</td><td colspan="3">Monitoring Results:</td></tr>
<tr><td></td><td colspan="2">North Lantau Social Cluster</td><td colspan="3" rowspan="2">for the Monitoring Period</td></tr>
<tr><td></td><td>Action Level (AL)</td><td>Limit Level (LL)</td></tr>
<tr><td>NEL</td><td>STG < 4.2 & ANI < 15.5</td><td rowspan="2">NEL: (STG < 2.4 & ANI < 8.9) and NWL: (STG < 3.9 & ANI < 17.9)</td><td><u>STG = 0</u></td><td>&</td><td><u>ANI = 0</u></td></tr>
<tr><td>NWL</td><td>STG < 6.9 & ANI < 31.3</td><td><u>STG = 2.4 ± 1.88</u></td><td>&</td><td><u>ANI = 8.0 ± 6.60</u></td></tr>
</table>
Remarks: 1. STG means quarterly encounter rate of number of dolphin sightings
2. ANI means quarterly encounter rate of total number of dolphins
3. For North Lantau Social Cluster, AL will be triggered if <u>either NEL or NWL</u> falls below the criteria; LL will be triggered if <u>both NEL and NWL</u> fall below the criteria
4. Bold means AL exceedance
5. <u>Bold with underline</u> means LL exceedance
</td></tr>
<tr><td>Possible reason for Action or Limit Level Non-compliance</td><td>
(a) Causes of Exceedance

During CWD monitoring in the reporting period, no adverse impact from the activities of HZMB HKBCF project on dolphin was noticeable from general observations.
After review of all available and relevant data, including the raw data and analyses of other parameters included in the EM&A, no significant variation is detected in key environmental parameters.
As confirmed with Engineer’s Representative, there were no works under the other HKBCF contracts (i.e. HY/2013/01, HY/2013/02, HY/2013/03 and HY/2014/05) during December 2018 – February 2019, and the EM&A programmes under the abovementioned contracts were terminated as per EPD’s memo dated 1 February 2019.
Also, 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 December 2018 – February 2019. Moreover, the localised silt curtains under HY/2013/04 were removed on 4 January 2019.
Current mitigation measures were being upheld and Dolphin Watching Plan under Contract No. HY/2013/04 was implemented until completion of the removal of localised silt curtains under HY/2013/04 on 4 January 2019. There was no failure or reduction of dolphin-specific mitigation measures.
It was concluded that the HZMB construction work is one of the contributing factors affecting the dolphins. It was also concluded the contribution of impacts due to individual HZMB contracts and processes cannot be separated from the other activities within the dolphin habitat.

</td></tr>
</table>

Actions taken / to be taken	**(b) Action required under the action plan** Please refer to the corresponding Event and Action Plan **(c) Action taken under the action plan** **1) Statistical data analysis has been repeated to confirm findings** 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 impact monitoring periods. The two variables that were examined included the two periods (baseline and impact phases) and two locations (NEL and NWL). 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 0.0041 and 0.0221 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. **2) All available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A have been reviewed** The AFCD monitoring data during December 2018 to February 2019 has been reviewed by the dolphin specialist engaged under this Contract. During the same quarter, no dolphin was sighted from 83.03 km of survey effort on primary lines in NEL, while only four groups of 14 dolphins were sighted from 127.29 km of survey effort on primary lines in NWL. This review has confirmed that the low occurrence of dolphins reported by the monitoring surveys in winter 2018-19 in NEL and NWL survey area is accurate. Furthermore, for water quality monitoring during this reporting period, the following exceedances were recorded and investigated: • During December 2018, six exceedances of water quality (consisting of five Action Level exceedances and one Limit Level exceedance of suspended solids) were recorded. **Following investigations, it was concluded that the exceedances were not related to the HZMB HKBCF project.** • During January 2019, **no Action and Limit Level exceedances were recorded.** • During February 2019, the water quality monitoring programme was temporarily suspended, therefore no water quality monitoring was conducted, no water quality monitoring results were recorded, and **no Action and Limit Level exceedances were recorded.** **3) Identification of source of impact was carried out** During this reporting period of dolphin monitoring, no adverse impact on dolphin from the works activities of HZMB HKBCF project was noticeable from general observations. Nevertheless, dolphin mitigation measures were being upheld until completion of the removal of localised silt curtains on 4 January 2019 and the Dolphin Watching Plan was implemented from the start of the works of the Project until 4 January 2019.

It is also noted that another ongoing project has expanded extensively in scale and now occupies considerable areas of NWL; it has prevented the successful completion of some of the transect lines and is in addition to the existing pressures the dolphins faced in the Lantau habitat before the HZMB development started (e.g. boat traffic, habitat degradation, pollution, competition with fisheries). The same project has already been noted as influencing a large part of NWL, which dolphins seem to have entirely vacated.

Investigation reports into previous dolphin monitoring exceedances prepared by the ET for Contract No. HY/2010/02 had concluded that there were ongoing construction works, both Project related and not, which were known to impact dolphins. While no adverse impact was observed from HZMB HKBCF activities on dolphins during this reporting period, the long-term impacts of these works cannot be assessed although expanding the scope of monitoring areas will provide better data on impacts outside the NEL and NWL zones.

4) The IEC, ER and Contractor have been informed of findings

ET of HY/2013/04 notified the exceedance as follows:

- 18 April 2019 (Notification No. 201812-201902D_NOE)
- 22 May 2019 (Notification No. 201812-201902D_NOE_r1)

5) Monitoring data have been checked

See Point (2) above.

6) Repeated review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary

Site inspection of the silt curtain integrity was conducted during weekly site inspection. The appropriate mitigation monitoring was in place depending on site activities (i.e., Dolphin Exclusion Zone (DEZ)/Dolphin Watching Plan (DWP) for silt curtain deployment and all other Project activities, respectively). These activities continued until completion of the removal of localised silt curtains under Contract No. HY/2013/04 on 4 January 2019.

After investigation, there was no evidence that indicated that the reduced number of dolphins in NWL and NEL was related solely to Project works. It was also concluded that the contribution of impacts due to the HZMB works as a whole (or individual contracts) cannot be quantified nor separate from the other stress factors.

(d) ET's conclusions and recommendations for mitigation

Current mitigation measures for CWD were implemented fully, and the Contractor was reminded to consistently implement existing mitigation measures.

Investigation reports into previous dolphin monitoring exceedances prepared by the ET for Contract No. HY/2010/02 have noted that the current monitoring works under the EM&A programmes have already provided a high level of monitoring effort, that additional monitoring in the monitoring areas was not considered necessary, and that existing data can be reviewed and alternative analytical methods can be explored to determine any new insight to the dolphin distribution pattern.

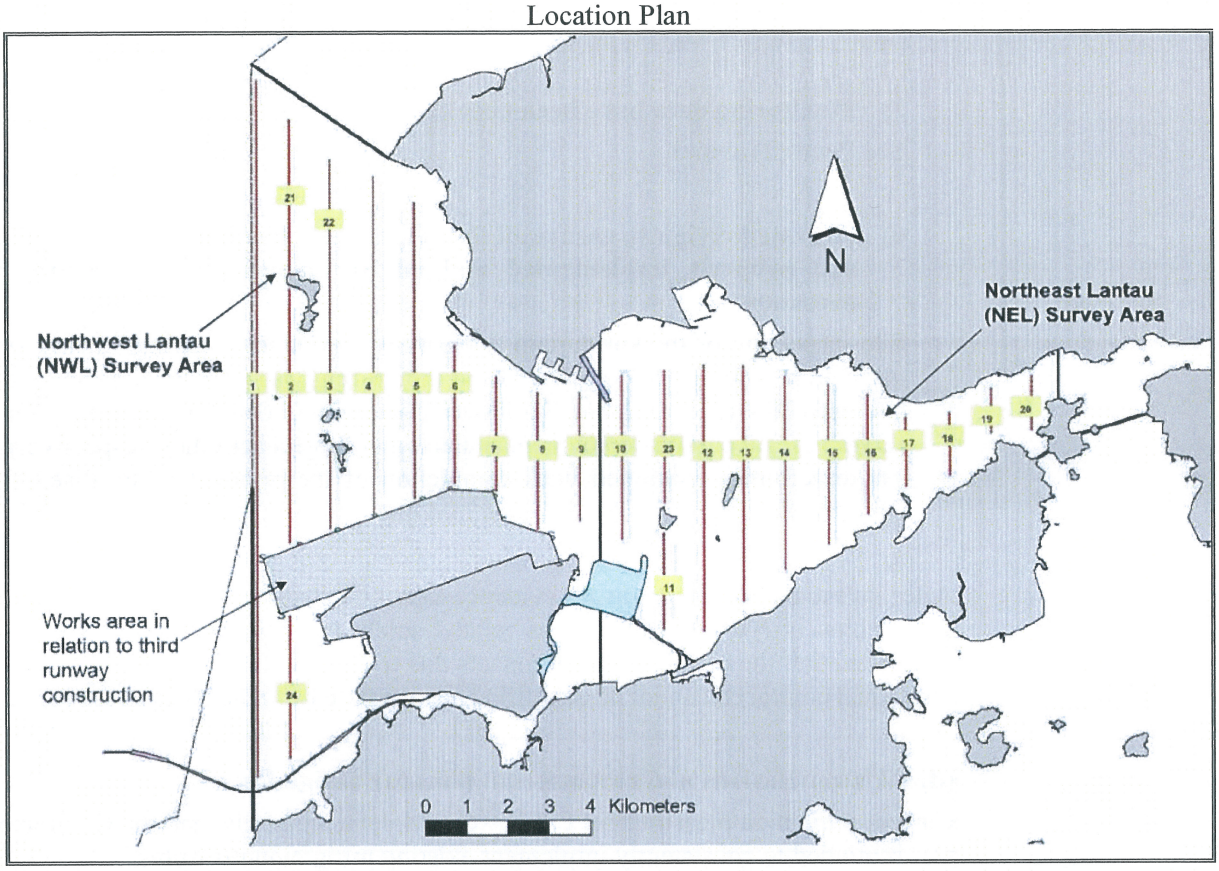
	(e) Contractor's actions to implement the mitigation • Although this exceedance was considered not solely caused by HZMB HKBCF Project, the Contractor is reminded to fully implement all relevant mitigation measures identified in the EM&A Manual.
Remarks	-

(Location Plan – please refer below)

Prepared by: Gary Chow
Designation: Environmental Team Leader (Contract No. HY/2013/04)
Signature:

Date: 19 June 2019

Location Plan



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

Covering Period: No.2: 24 Dec 2018 to 23 Feb 2019 **Reported By:** Keith Chau

Time: --- **Weather Condition:** ---

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)?	☐	☒	☐	Remark [1]
1.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	☐	☒	☐	Remark [1]
1.3	Are trees or limb overhanging branches pruned?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
1.5	Are litter and debris removed?	☐	☒	☐	Remark [1]
1.6	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
1.7	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
1.8	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
1.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
1.10	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

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)?	☐	☒	☐	Remark [1]
2.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	☐	☒	☐	Remark [1]
2.3	Are trees or limb overhanging branches pruned?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
2.5	Are litter and debris removed?	☐	☒	☐	Remark [1]
2.6	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
2.7	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
2.8	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
2.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
2.10	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

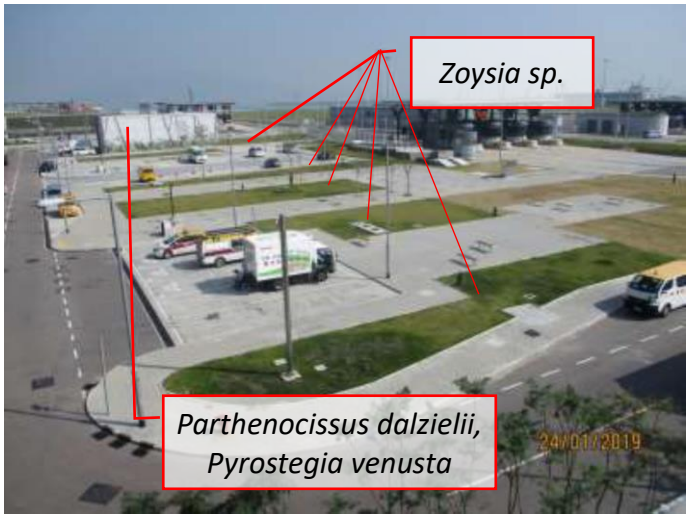
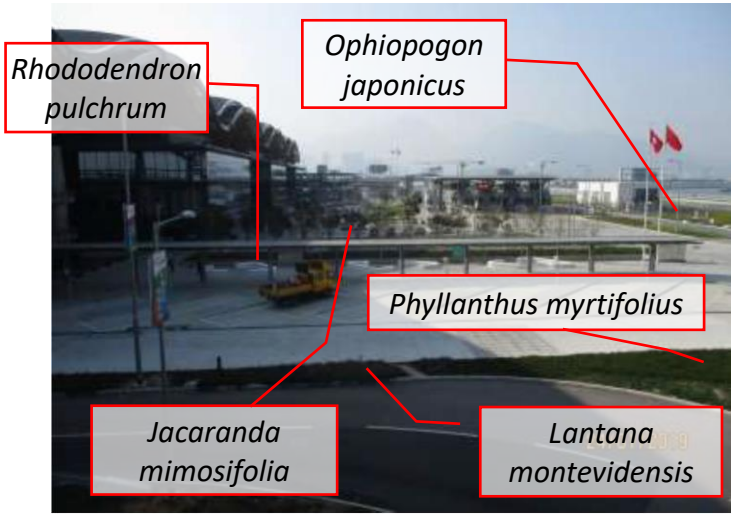
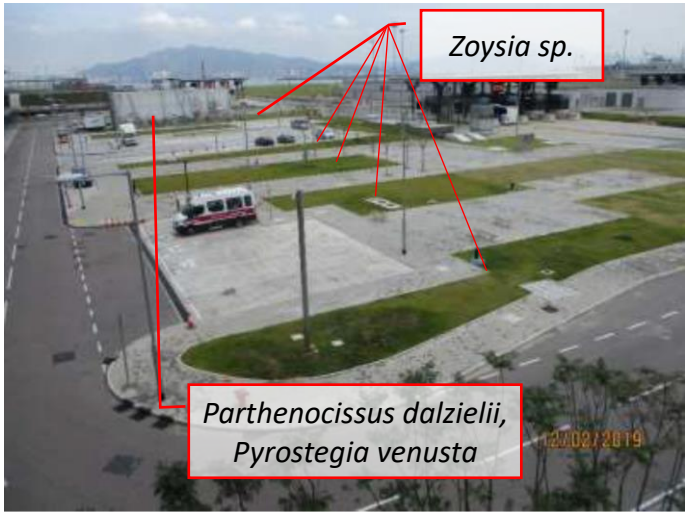
3	Planting in Outdoor Planters of Passenger Clearance Building	N/A or not observed	Yes	No	Remarks / Photo
3.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	☐	☒	☐	Remark [1]
3.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	☐	☒	☐	Remark [1]
3.3	Are trees or limb overhanging branches pruned?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
3.5	Are litter and debris removed?	☐	☒	☐	Remark [1]
3.6	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
3.7	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
3.8	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
3.10	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

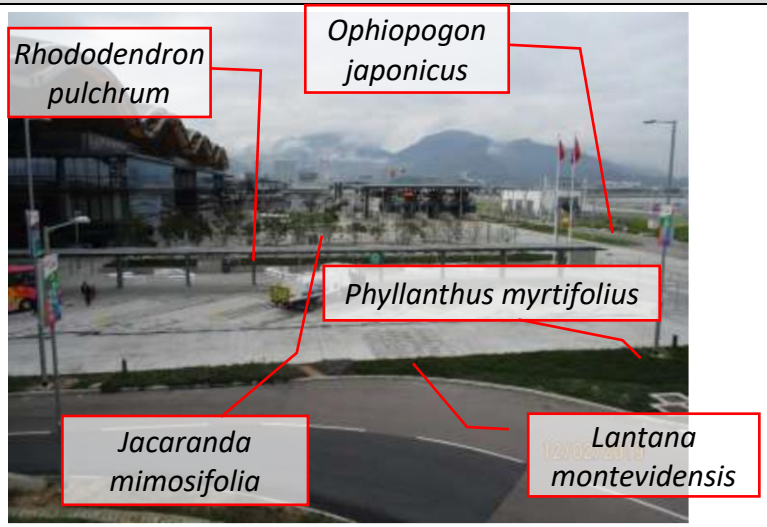
4	Planting in Indoor Planters of Passenger Clearance Building	N/A or not observed	Yes	No	Remarks / Photo
4.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	☐	☒	☐	Remark [1]
4.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	☐	☒	☐	Remark [1]
4.3	Are trees or limb overhanging branches pruned?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
4.5	Are litter and debris removed?	☐	☒	☐	Remark [1]
4.6	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
4.7	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
4.8	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
4.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
4.10	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

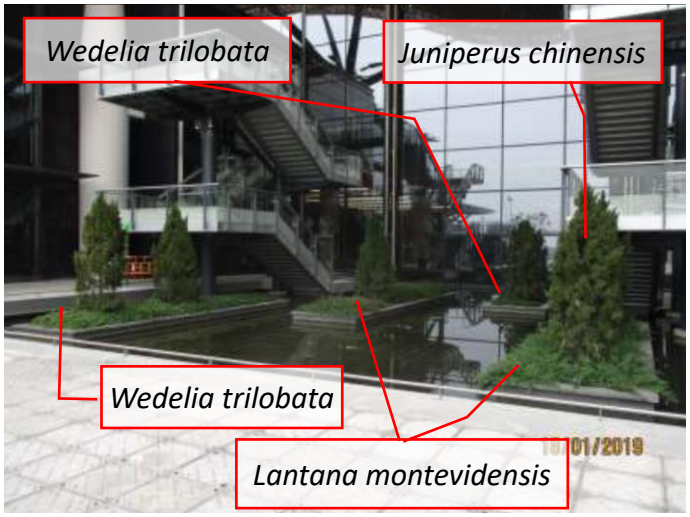
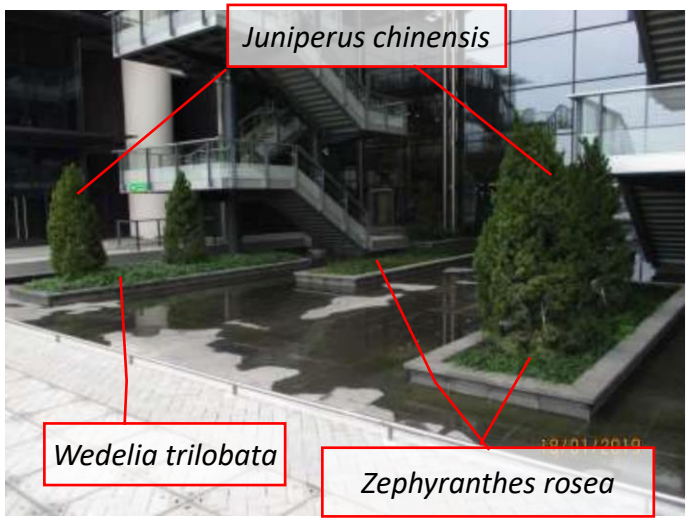
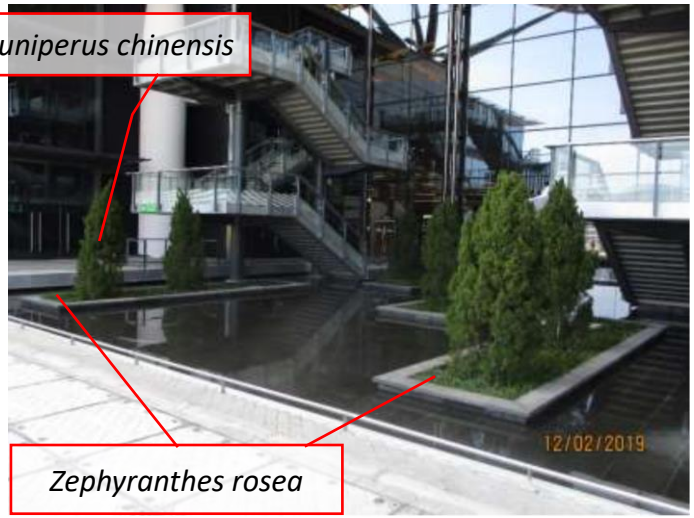
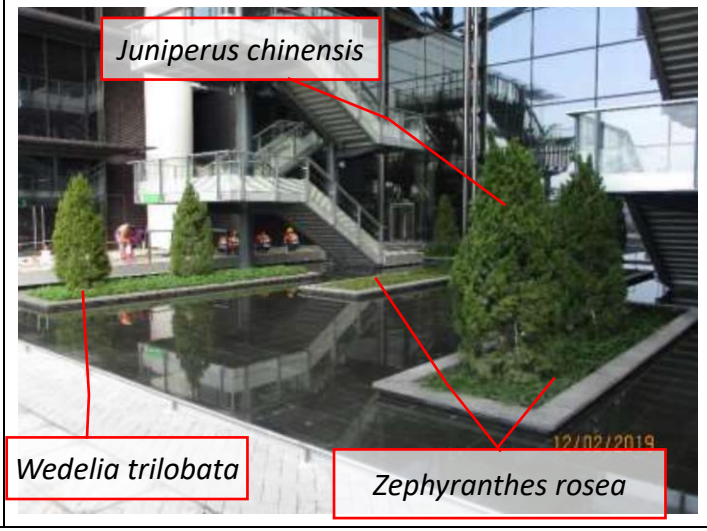
10	General Document	N/A or not observed	Yes	No	Remarks / Photo
11.1	Are the records of watering, fertilizing, weeding, pruning and mowing kept for checking?	☐	☒	☐	Remark [1]

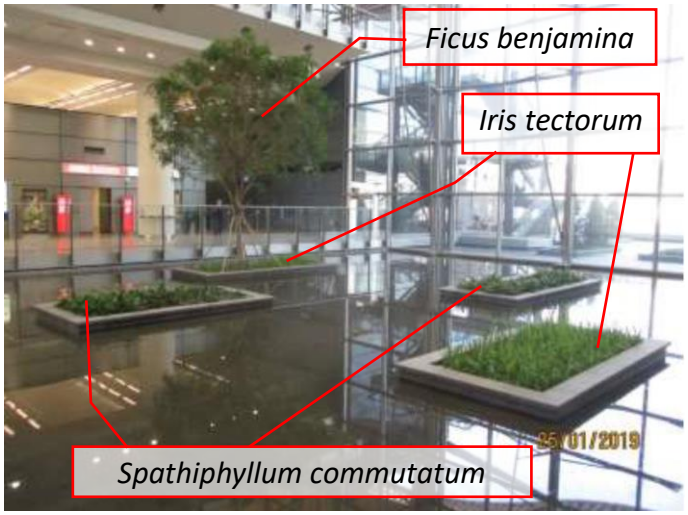
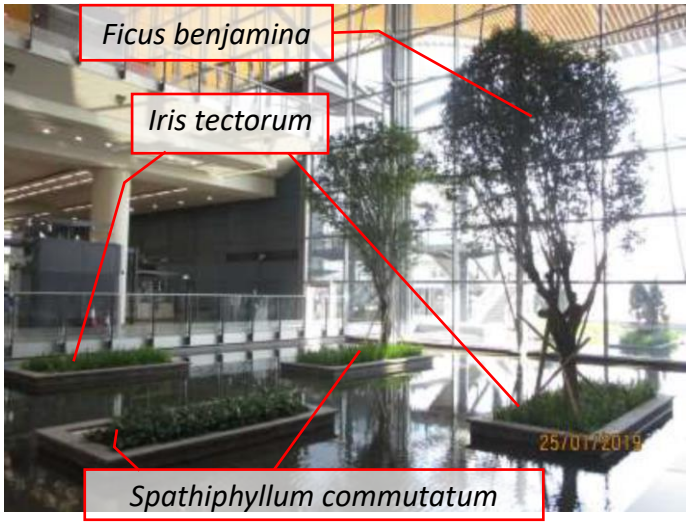
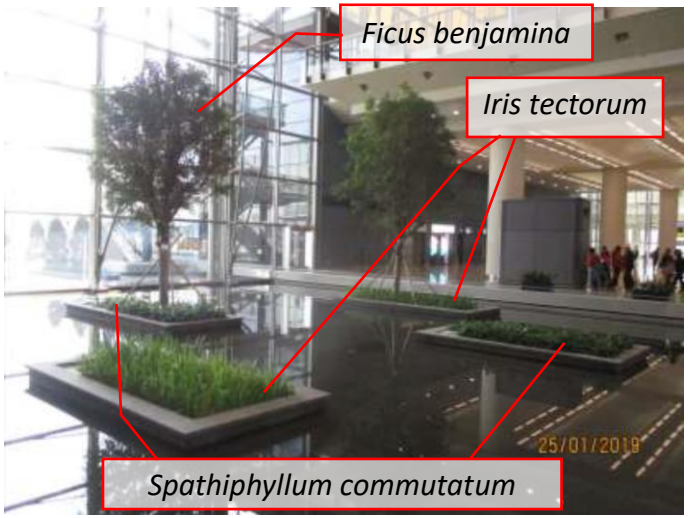
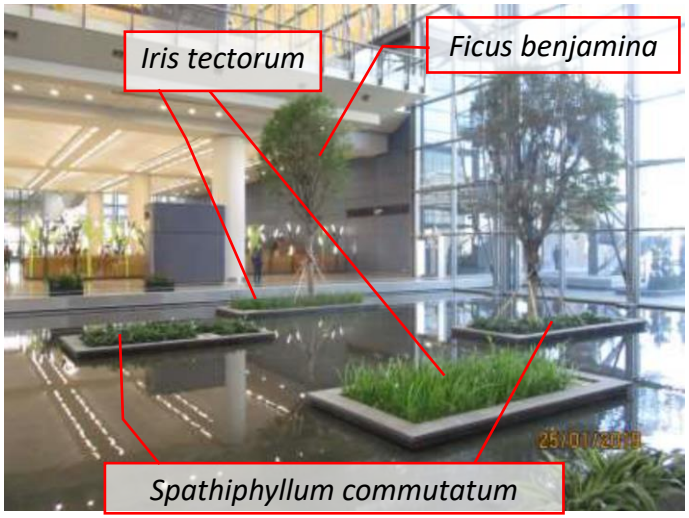
Follow up actions for previous Site Audit: **N/A**
Observations: **N/A**
Corrective Actions (if any): **N/A**
Remark: [1] This Checklist is prepared based on the information from "Soft Landscape works – Monthly Maintenance Report (16 December 2018 to 15 January 2019" (*CSF No.: H2620-CSF-LCJ-CON-007675*) and "Soft Landscape works – Monthly Maintenance Report (16 January 2019 to 15 February 2019" (*CSF No.: H2620-CSF-LCJ-CON-007678*), which prepared by Contractor and submitted to Engineer's Representative.
General Conclusion: 1. No typhoon signal was issued during the reporting period. 2. All trees in reasonably good condition. 3. All plants (shrubs, ground cover and turf) were in reasonably good condition. 4. The establishment works followed the maintenance programme.

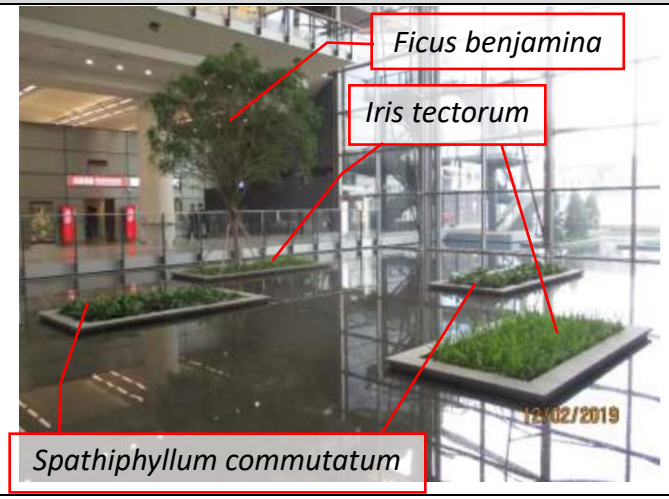
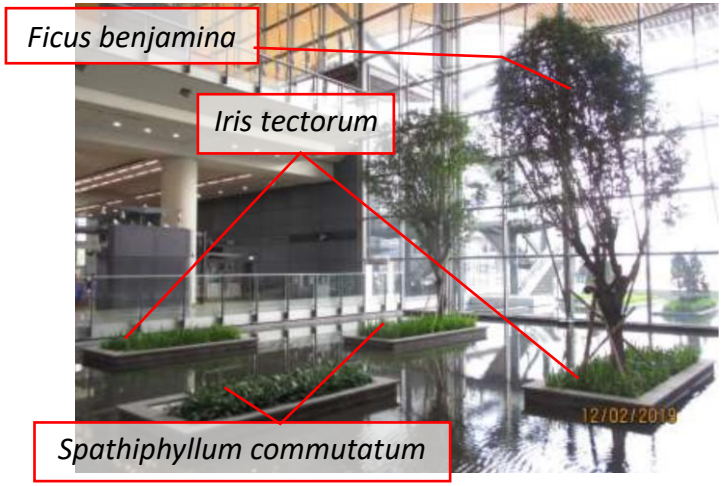
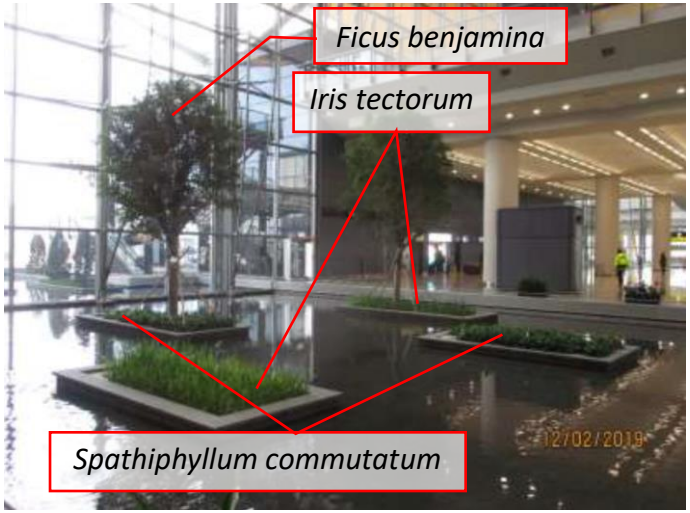
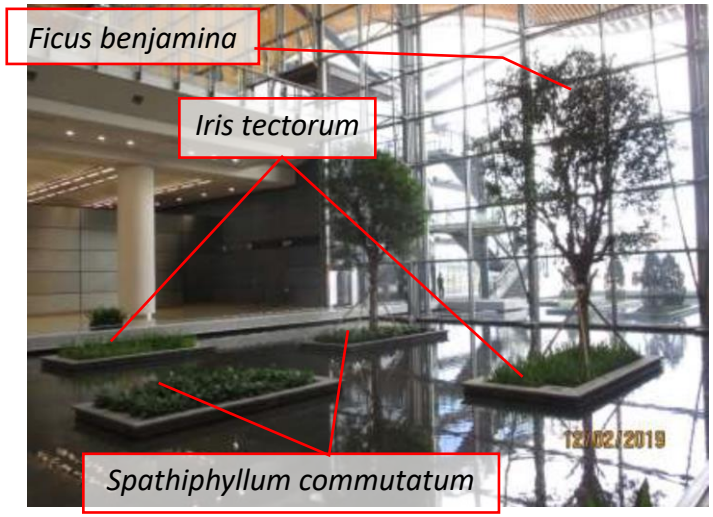
Reported by (ET's Representative):	Keith Chau	Title:	ET Leader
Signature:	Keith	Date:	15 July 2019
Reviewed by (AECOM Landscape Representative):	CHAN Pak Kin	Title:	RSfa(2)
Signature:		Date:	15 JUL 2019
Contractor's Representative:	Stephen Tsang	Title:	Environmental Officer
Signature:		Date:	15 July 2019
Checked by (IEC's Representative):	Harris Wong	Title:	ESS
Signature:		Date:	30 July 2019

Location	Photo Record [1]
At-grade planting of Passenger Clearance Building Photo 1 / Photo 2 Photo 3 / Photo 4 Photo 5 / Photo 6	   

Location	Photo Record [1]	
		

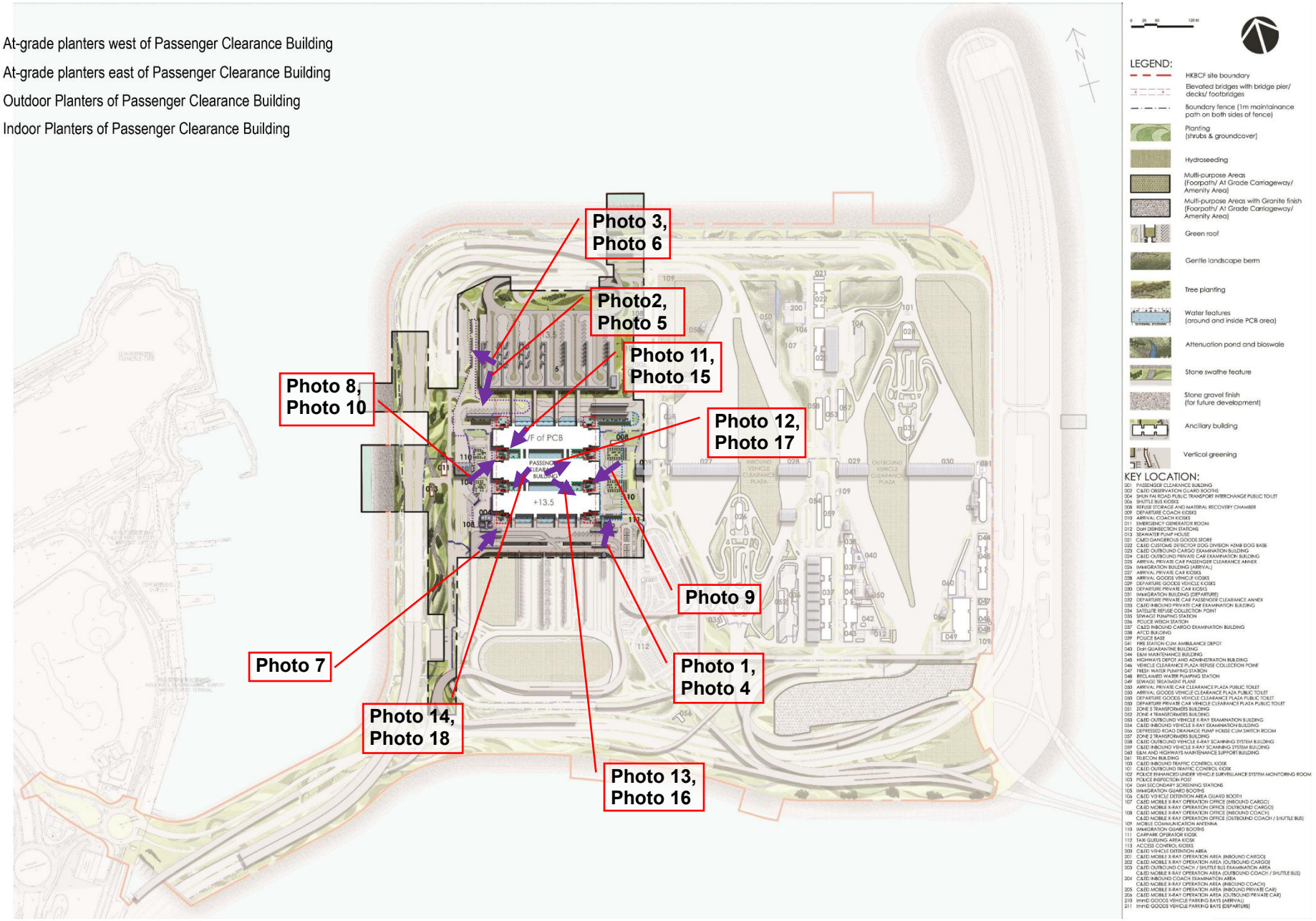
Location	Photo Record [1]
Planting in Outdoor Planters of Passenger Clearance Building **Photo 7** | **Photo 8** **Photo 9** | **Photo 10**	   

Location	Photo Record [1]
Planting in Indoor Planters of Passenger Clearance Building **Photo 11** | **Photo 12** **Photo 13** | **Photo 14** **Photo 15** | **Photo 16** **Photo 17** | **Photo 18**	   

Location	Photo Record [1]	
		
		

Note: [1] Extract from "Soft Landscape works – Monthly Maintenance Report (16 December 2018 to 15 January 2019" (*CSF No.: H2620-CSF-LCJ-CON-007675*) and "Soft Landscape works – Monthly Maintenance Report (16 January 2019 to 15 February 2019" (*CSF No.: H2620-CSF-LCJ-CON-007678*), which prepared by Contractor and submitted to Engineer's Representative.

- 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



AECOM Aedas
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI

AGREEMENT No. CE 13/2010 (CE)
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES
(SUPERSTRUCTURES AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION
MASTER LANDSCPE PLAN FOR CONTRACT NO. HY/2013/01 (C1) (LEVEL: FIRST FLOOR)

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

TREE PLANTING [1]

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

SHRUB PLANTING [1]

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

GREEN ROOF GROUND COVER PLANTING [1]

SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]
Zan	*Zephyranthes candida*	蕥蓮	100(H) x 100(SP)	100

CLIMBER PLANTING [1]

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

GROUND COVER PLANTING [1]

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

TURFING [1]

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

HYDROSEEDING [1],[2]

SPECIES CODE	BOTANICAL NAME	CHINESE NAME
Cda *, **	*Cynodon dactylon*	百慕達草
Pno	*Paspalum notatum*	百喜草
Eop * / Lpe	*Eremochloa ophiuroides / Lolium perenne*	假儉草 / 黑麥草

INDOOR PLANTING IN PASSENGER CLEARANCE BUILDING [1]

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

NOTES:

[1] All proposed plant species and specifications are subject to change during construction to suit the site conditions.

[2] 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

東業運動測試顧問有限公司
ETS-TESTCONSULT LIMITED

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

Landscape Inspection Checklist

Inspection Date: 20.2.19 **Inspection By:** Frankie Tung / Ivy Lo

Time: 14:00 **Weather Condition:** Fine

Participants: Endy Tse, Pak Kin Chan

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)?	☐	☑	☐	
1.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	☑	☐	☐	
1.3	Are litter and debris removed?	☐	☑	☐	
1.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
1.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
1.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
1.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
1.8	Are the plants in satisfied condition?	☐	☑	☐	

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)?	☐	☑	☐	
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?	☑	☐	☐	
2.3	Are litter and debris removed?	☐	☐	☑	Item 1
2.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
2.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
2.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
2.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
2.8	Are the plants in satisfied condition?	☐	☑	☐	

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)?	☐	☑	☐	
3.2	Are tree stakes, guys and ties provided properly for safety and avoid chaffing of bark?	☐	☑	☐	
3.3	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	☑	☐	☐	
3.4	Are litter and debris removed?	☐	☑	☐	
3.5	Are trees or limb overhanging branches pruned?				
3.6	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
3.7	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
3.8	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
3.10	Are the plants in satisfied condition?	☐	☑	☐	

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)?	☐	☑	☐	
4.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	☑	☐	☐	
4.3	Are litter and debris removed?	☐	☑	☐	
4.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
4.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
4.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
4.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
4.8	Are the plants in satisfied condition?	☐	☑	☐	

5	Zone 5	N/A or not observed	Yes	No	Remarks / Photo
5.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	☐	☑	☐	
5.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	☑	☐	☐	
5.3	Are litter and debris removed?	☐	☑	☐	
5.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
5.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
5.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
5.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
5.8	Are the plants in satisfied condition?	☐	☑	☐	

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)?	☐	☑	☐	
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?	☑	☐	☐	
6.3	Are litter and debris removed?	☐	☑	☐	
6.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
6.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
6.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
6.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
6.8	Are the plants in satisfied condition?	☐	☑	☐	

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)?	☑	☐	☐	
7.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	☑	☐	☐	
7.3	Are litter and debris removed?	☐	☑	☐	
7.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
7.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
7.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
7.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
7.8	Are the plants in satisfied condition?	☐	☑	☐	

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)?	☑	☐	☐	
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?	☑	☐	☐	
8.3	Are litter and debris removed?	☐	☑	☐	
8.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
8.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
8.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
8.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
8.8	Are the plants in satisfied condition?	☐	☑	☐	

9	Zone 9	N/A or not observed	Yes	No	Remarks / Photo
9.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	☑	☐	☐	
9.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	☑	☐	☐	
9.3	Are litter and debris removed?	☐	☑	☐	
9.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
9.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
9.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
9.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
9.8	Are the plants in satisfied condition?	☐	☑	☐	

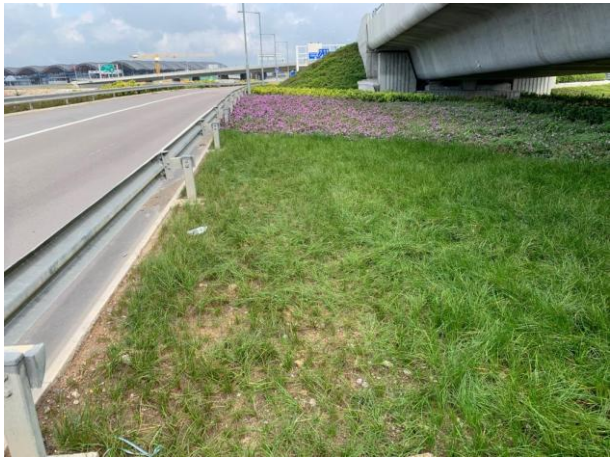
10	Zone 10	N/A or not observed	Yes	No	Remarks / Photo
10.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	☑	☐	☐	
10.2	After exceptional weather conditions, are proper action implemented to replace dead plants, repair damaged plants, bed in all plants that have blown over, firm up all other plants and immediately thereafter, remove dead plants and plant debris from the site?	☑	☐	☐	
10.3	Are litter and debris removed?	☐	☑	☐	
10.4	Are planting areas matched with the approved landscape plan?	☐	☑	☐	
10.5	Is planting pattern matched with the approved landscape plan?	☐	☑	☐	
10.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☑	☐	
10.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☑	☐	
10.8	Are the plants in satisfied condition?	☐	☑	☐	

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?	☑	☐	☐	

Follow up actions for pervious Site Audit:	N/A
Observations	Item I: General refuse was observed at Zone 2
Corrective Actions (if any):	Item I: General refuse has been removed immediately after it was observed on site
General Conclusion:	All plants in satisfied condition.

Inspected by (ET Representative):	Frankie Tang	Title:	E.T
Signature:		Date:	20.2.19
Reviewed by (AECOM Landscape Representative):	CHAN Pak Kin	Title:	RSFO(2)
Signature:		Date:	28 FEB 2019
Contractor Representative:	Endy Tse	Title:	EO
Signature:		Date:	20/2/2019
Checked by (IEC Representative):	Harris Wong	Title:	ESS
Signature:		Date:	04/07/2019

Location	Species	Photo Record
Zone 1	- *Ophiopogon japonicus* - *Zephyranthes candida* - *Aglaia odorate*	 
Zone 2	- *Liriope spicata*	

<table>
<tr><th>Location</th><th>Species</th><th colspan="2">Photo Record</th></tr>
<tr><td>Zone 2</td><td>- Liriope spicata
- Lantana montevidensis</td><td> 
Item 1 – Improper disposal of general refuse</td><td> 
Follow-up action – The general refuse was collected immediately</td></tr>
<tr><td>Zone 3</td><td>- Bauhinia variegata</td><td colspan="2">  </td></tr>
</table>

Location	Species	Photo Record
Zone 4	- *Lantana montevidensis*	
Zone 5	- *Wedelia trilobata* - *Strelitzia reginae*	

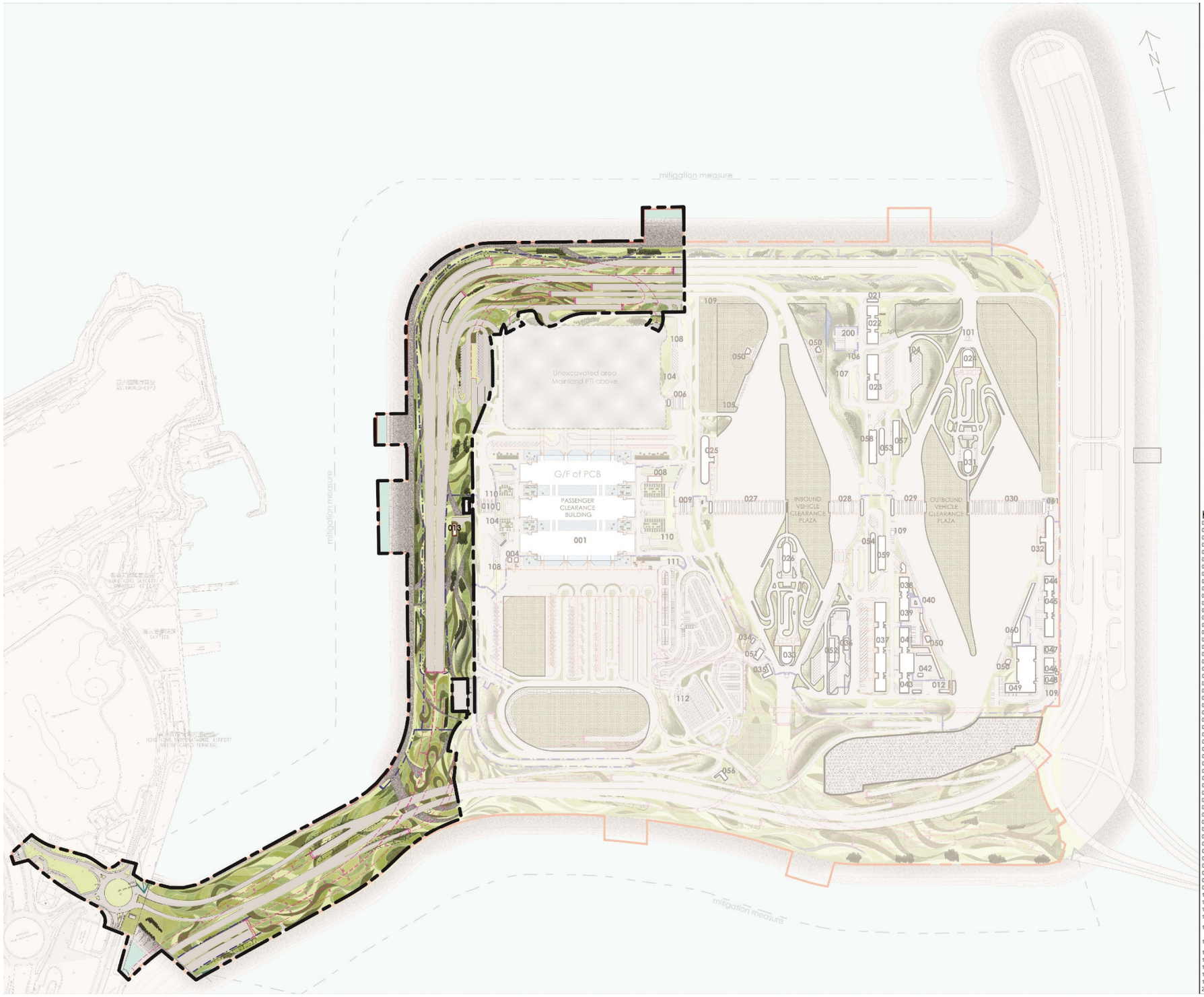
Location	Species	Photo Record
Zone 6	- *Nephrolepis hirsutula* - *Zoysia sp.*	
Zone 7	- *Rhododendron simsil* - *Strelitzia reginae*	 

Location	Species	Photo Record
Zone 8	- *Zephyranthes candida* - *Ophiopogon japonicus*	
Zone 9	- *Zephyranthes candida* - *Ophiopogon japonicus* - *Strelitzia reginae*	 

Location	Species	Photo Record
Zone 10	- *Wedelia trilobata*	

Appendix A

Location Plan



0 25 50 120 M

N

LEGEND:

- HKBCF site boundary
- Elevated bridges with bridge pier/ decks/ footbridges
- Boundary fence (1m maintainance path on both sides of fence)
- Planting (shrubs & groundcover)
- Hydroseeding
- Multi-purpose Areas (Foorpath/ At Grade Carriageway/ Amenity Area)
- Multi-purpose Areas with Granite finish (Foorpath/ 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 DoH 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 DoH 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 DEPRESSED 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 DoH SECONDARY SCREENING STATIONS
105 IMMIGRATION GUARD BOOTHS
106 C&ED VEHICLE DETENTION AREA GUARD BOOTH
107 C&ED MOBILE X-RAY OPERATION OFFICE (INBOUND CARGO)
C&ED MOBILE X-RAY OPERATION OFFICE (OUTBOUND CARGO)
108 C&ED MOBILE X-RAY OPERATION OFFICE (INBOUND COACH)
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

AECOM Aedas
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI

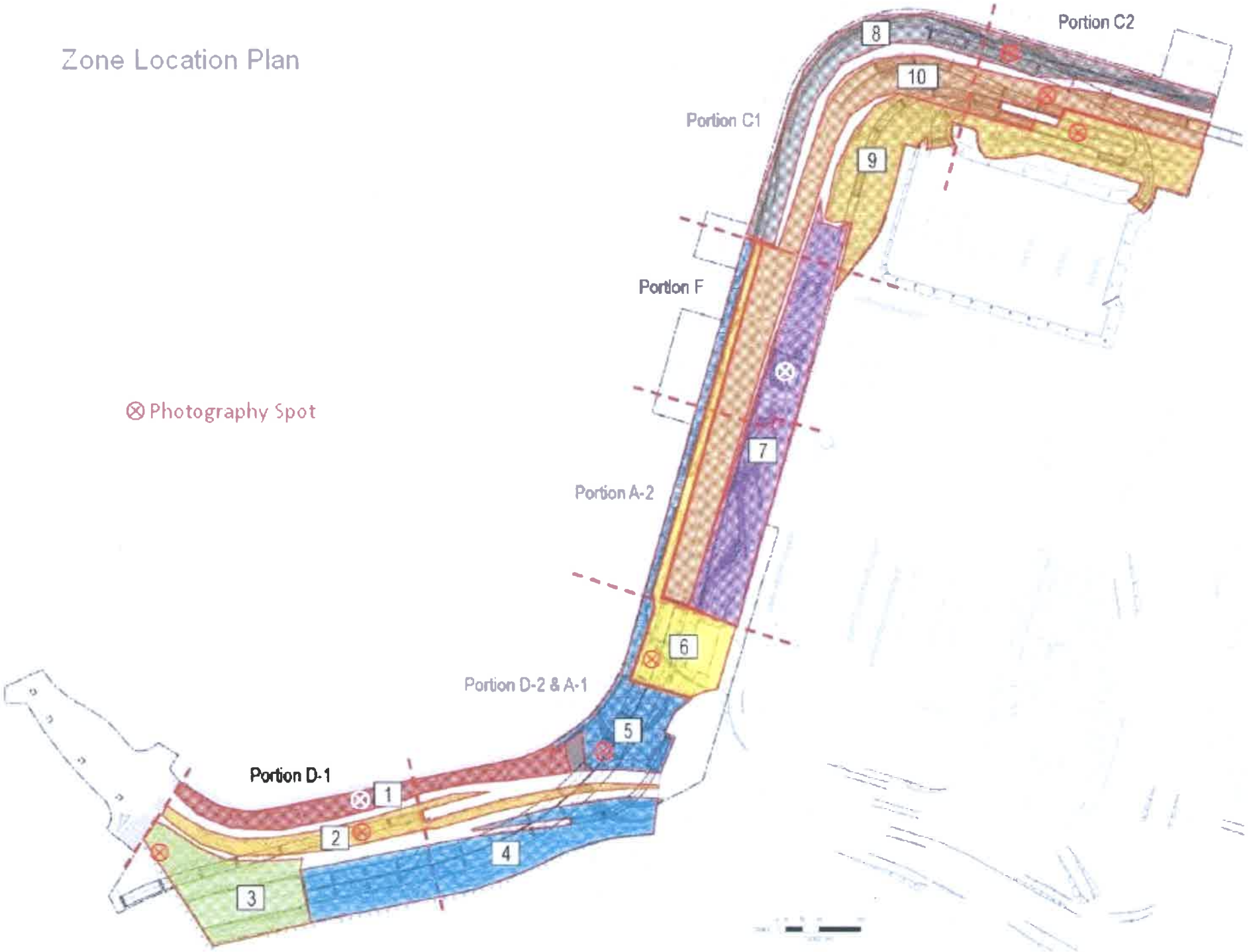
AGREEMENT No. CE 13/2010 (CE)
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES
(SUPERSTRUCTURES AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION

MASTER LANDSCPE PLAN FOR CONTRACT NO. HY/2013/02 (C2) (LEVEL: GROUND LEVEL)

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

Zone Location Plan

⊗ Photography Spot



Appendix B

Planting Schedule

TREE PLANTING [1]

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

SHRUB PLANTING [1]

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

GREEN ROOF GROUND COVER PLANTING [1]

SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]
Zan	*Zephyranthes candida*	葱蓮	100(H) x 100(SP)	100

CLIMBER PLANTING [1]

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

GROUND COVER PLANTING [1]

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

TURFING [1]

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

HYDROSEEDING [1],[2]

SPECIES CODE	BOTANICAL NAME	CHINESE NAME
Cda *, **	*Cynodon dactylon*	百慕達草
Pno	*Paspalum notatum*	百喜草
Eop * / Lpe	*Eremochloa ophiuroides / Lolium perenne*	假儉草 / 黑麥草

INDOOR PLANTING IN PASSENGER CLEARANCE BUILDING [1]

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

NOTES:

[1] All proposed plant species and specifications are subject to change during construction to suit the site conditions.

[2] 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

AECOM

AGREEMENT NO. CE 13/2010 (CE)

HONG KONG-ZHUHAI-MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES (SUPERSTRUCTURES AND INFRASTRUCTURES) DESIGN AND CONSTRUCTION

PLANTING SCHEDULE

SCALE	N.T.S.	DATE	18 MAY 2018
FIGURE NO.	FIGURE 3.6		

NIL Checklist for HyD Contract No. HY/2013/03 for February 2019

Covering Period: No.2: 24 Dec 2018 to 23 Feb 2019 **Reported By:** Keith Chau

Time: --- **Weather Condition:** ---

1	**Building 022 at-grade planting**	**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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
1.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
1.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
1.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
1.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
1.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
1.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

2	**Building 023 at-grade planting**	**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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
2.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
2.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
2.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
2.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
2.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
2.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

3	Building 023 roof greening	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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
3.5	Are litter and debris removed?	☐	☒	☐	Remark [1]
3.6	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
3.7	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
3.8	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
3.9	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
3.10	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

4	Building 025 at-grade planting	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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
4.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
4.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
4.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
4.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
4.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
4.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
5.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
5.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
5.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
5.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
5.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
5.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
6.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
6.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
6.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
6.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
6.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
6.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
7.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
7.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
7.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
7.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
7.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
7.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
8.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
8.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
8.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
8.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
8.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
8.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
9.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
9.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
9.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
9.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
9.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
9.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

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)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
10.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
10.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
10.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
10.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
10.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
10.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

11	Building 058 at-grade planting	N/A or not observed	Yes	No	Remarks / Photo
11.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
11.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
11.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
11.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
11.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
11.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
11.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

12	Building 059 at-grade planting	N/A or not observed	Yes	No	Remarks / Photo
12.1	Is watering provided to all plants to ensure satisfactory growth and health (manual and automatic irrigation)?	☐	☒	☐	Remark [1]
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?	☒	☐	☐	Remark [1]
12.3	Are litter and debris removed?	☐	☒	☐	Remark [1]
12.4	Are planting areas matched with the approved landscape plan?	☐	☒	☐	Remark [1]
12.5	Is planting pattern matched with the approved landscape plan?	☐	☒	☐	Remark [1]
12.6	Are planting locations and spacing matched with the approved landscape plan?	☐	☒	☐	Remark [1]
12.7	Are the planting species on site matched with Figure 3.6 of the approved landscape plan?	☐	☒	☐	Remark [1]
12.8	Are the plants in satisfied condition?	☐	☒	☐	Remark [1]

13	General Document	N/A or not observed	Yes	No	Remarks / Photo
13.1	Are the records of watering, fertilizing, weeding, pruning and mowing kept for checking?	☐	☒	☐	Remark [1]

Follow up actions for previous Site Audit:

N/A

Observations:

N/A

Corrective Actions (if any):

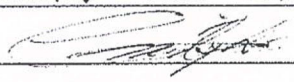
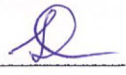
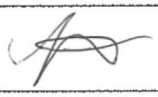
N/A

Remark:

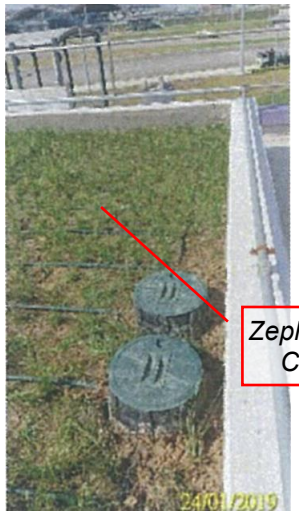
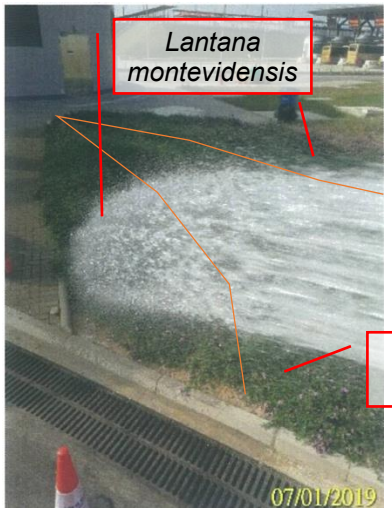
[1] This Checklist is prepared based on the information from "Planting Works Monthly Maintenance Report No.9 (24 December 2018 to 23 January 2019)" (*CSF No.: RABF-CSF-LCJ-ABWF-003056*) and "Planting Works Monthly Maintenance Report No.10 " (24 January 2019 to 23 February 2019)" (*CSF No.: RABF-CSF-LCJ-ABWF-003072*), which prepared by Contractor and submitted to Engineer's Representative.

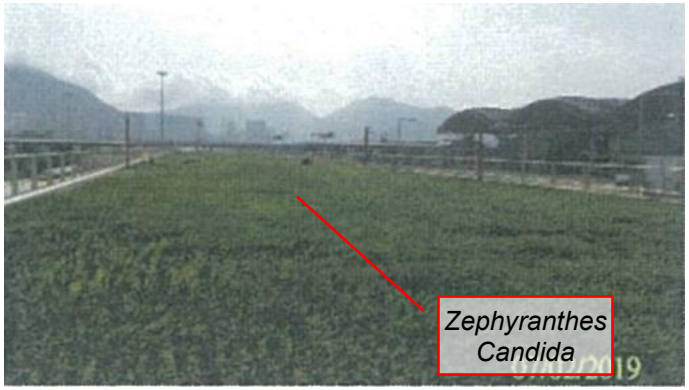
General Conclusion:

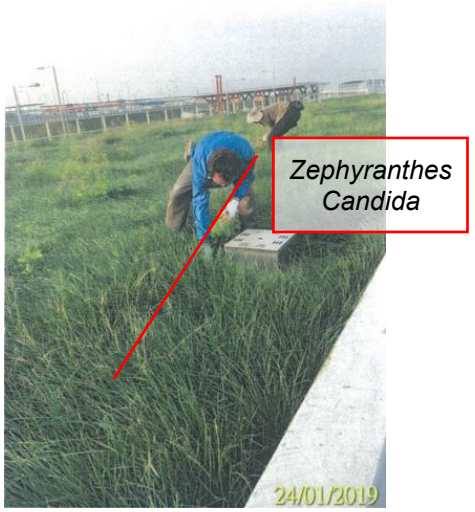
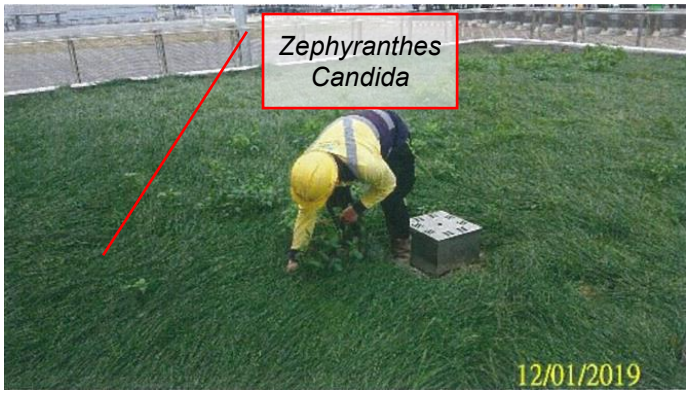
1. No typhoon signal was issued during the reporting period.
2. All plants (shrubs, ground cover and turf) were in reasonable condition.
3. The establishment works followed the maintenance programme.

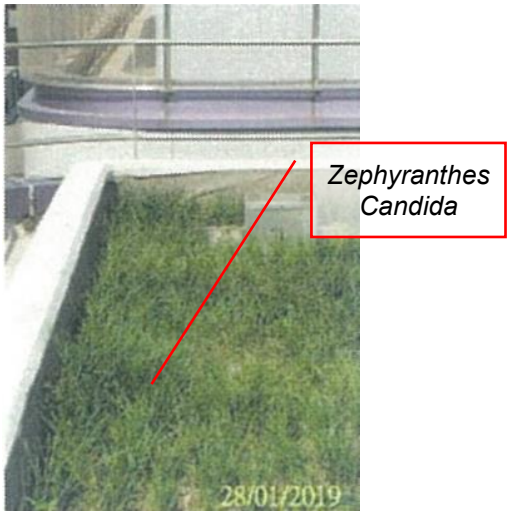
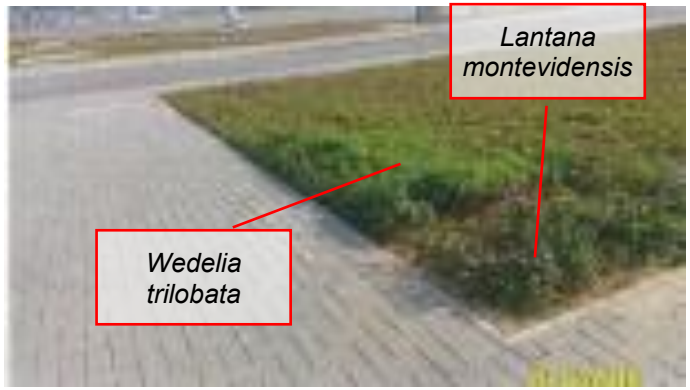
Reported by (ET's Representative):	Keith Chau	Title:	ET Leader
Signature:		Date:	15 July 2019
Reviewed by (AECOM Landscape Representative):	CHAN Pak Kin	Title:	RSFE (2)
Signature:		Date:	15 JUL 2019
Contractor's Representative:	Stephen Tsang	Title:	Environmental Officer
Signature:		Date:	15. July 2019
Checked by (IEC's Representative):	Harris Wong	Title:	ESS
Signature:		Date:	30 July 2019

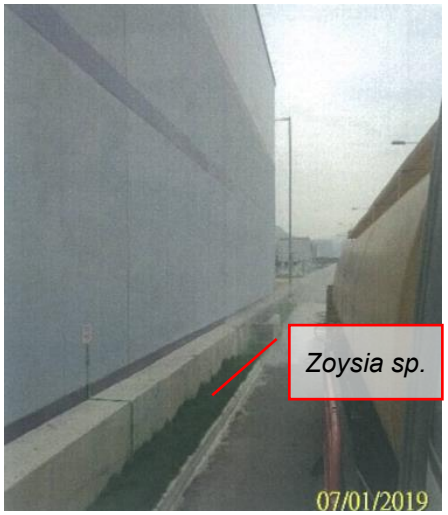
Location	Photo Record [1]	
Building 022 at-grade planting (Photo 1 and Photo 2)		
Building 023 at-grade planting (Photo 3 and Photo 4)		

Building 023 roof greening (Photo 5 and Photo 6)		
Building 025 at-grade planting (Photo 7 and Photo 8)		

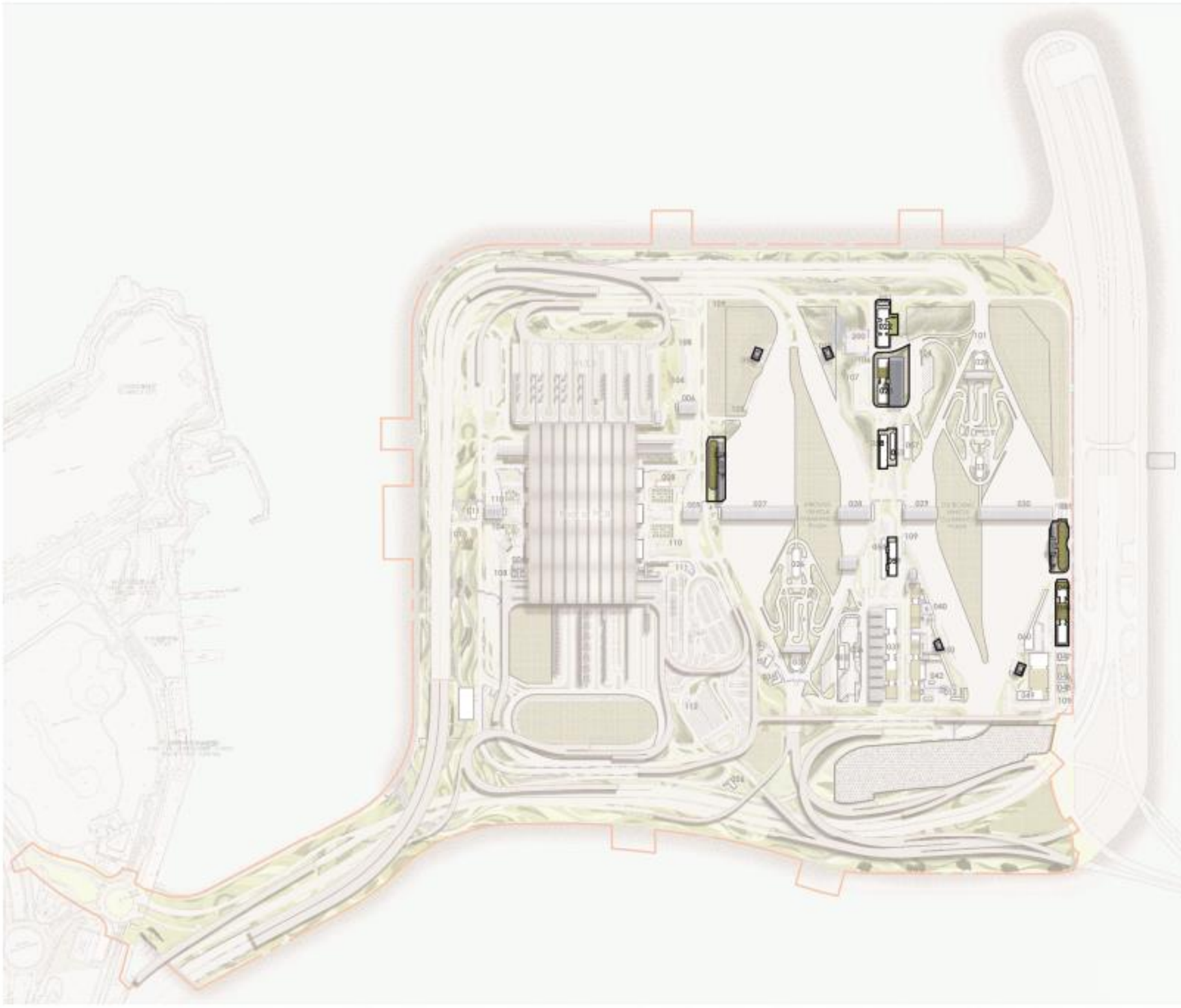
Building 025 roof greening (Photo 9)		
Building 032 at-grade planting (Photo 10 and Photo 11)		

Building 032 roof greening (Photo 12 and Photo 13)		
Building 044 roof greening (Photo 14)		

Building 045 roof greening (Photo 15 and Photo 16)		
Building 053 at-grade planting (Photo 17)		

Building 058 at-grade planting (Photo 18 and Photo 19)		
Building 059 at-grade planting (Photo 20 and Photo 21)		

Note: [1] Extract from "Planting Works Monthly Maintenance Report No.9 (24 December 2018 to 23 January 2019)" (*CSF No.: RABF-CSF-LCJ-ABWF-003056*) and "Planting Works Monthly Maintenance Report No.10 " (24 January 2019 to 23 February 2019)" (*CSF No.: RABF-CSF-LCJ-ABWF-003072*), which prepared by Contractor and submitted to Engineer's Representative.



LEGEND:

- HKBCF site boundary
- Elevated bridges with bridge pier/ decks/ footbridges
- Boundary fence (1m maintainance 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:

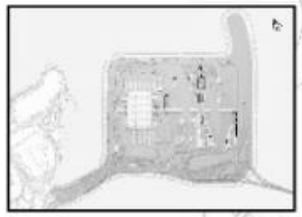
AECOM Aedas
Rogers Stirk Harbour + Partners
BURO HAPPOLD ATKINS ADI

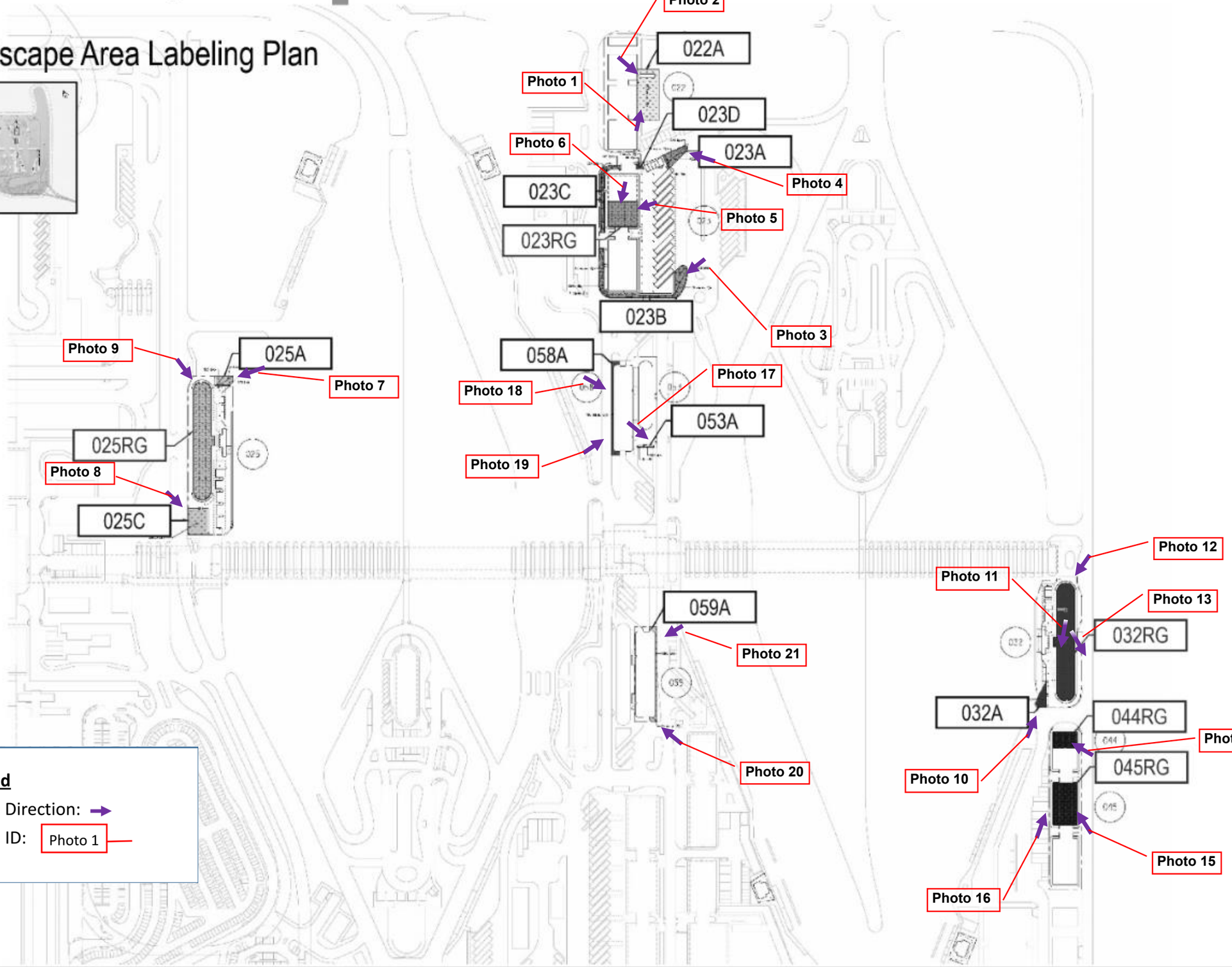
AGREEMENT No. CE 13/2010 (CE)
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES
(SUPERSTRUCTURES AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION
MASTER LANDSCPE PLAN FOR CONTRACT NO. HY/2014/05 (C8) (LEVEL: TOP VIEW)

SCALE	NA	DATE	MAY 2018
CHECK	ELK	DRAWN	TRT
JOB No.		DRAWING No.	REV
	AECMP01	B.5c	-

1. Planter Labeling Plans

- C8 Landscape Area Labeling Plan





TREE PLANTING [1]

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

SHRUB PLANTING [1]

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

GREEN ROOF GROUND COVER PLANTING [1]

SPECIES CODE	BOTANICAL NAME	CHINESE NAME	SIZE [mm]	SPACING [mm]
Zan	*Zephyranthes candida*	葱蓮	100(H) x 100(SP)	100

CLIMBER PLANTING [1]

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

GROUND COVER PLANTING [1]

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

TURFING [1]

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

HYDROSEEDING [1],[2]

SPECIES CODE	BOTANICAL NAME	CHINESE NAME
Cda *, **	*Cynodon dactylon*	百慕達草
Pno	*Paspalum notatum*	百喜草
Eop * / Lpe	*Eremochloa ophiuroides / Lolium perenne*	假儉草 / 黑麥草

INDOOR PLANTING IN PASSENGER CLEARANCE BUILDING [1]

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

NOTES:

[1] All proposed plant species and specifications are subject to change during construction to suit the site conditions.

[2] 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

AECOM

AGREEMENT NO. CE 13/2010 (CE)

HONG KONG-ZHUHAI-MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES (SUPERSTRUCTURES AND INFRASTRUCTURES) DESIGN AND CONSTRUCTION

PLANTING SCHEDULE

SCALE	N.T.S.	DATE	18 MAY 2018
FIGURE NO.	FIGURE 3.6		