

**Contract No. HY/2012/07  
Tuen Mun – Chek Lap Kok Link –  
Southern Connection Viaduct Section**

***Specification for Dolphin Exclusion Zone***

24 July 2014

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# Contract No. HY/2012/07

## Tuen Mun – Chek Lap Kok Link – Southern Connection Viaduct Section

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*Specification for Dolphin Exclusion Zone*

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Client:  Gammon		Project No:  0215660			
Summary:  This document presents the Specification for Dolphin Exclusion Zone for Tuen Mun – Chek Lap Kok Link Southern Connection Viaduct Section.		Date: 24 July 2014			
		Approved by:  			
		Mr Craig Reid Partner			
		Certified by:  			
		Mr Jovy Tam ET Leader			
	Specification for Dolphin Exclusion Zone	VAR	JT	CAR	24/07/14
Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p>		<p>Distribution</p> <p><input type="checkbox"/> Internal</p> <p><input checked="" type="checkbox"/> Public</p> <p><input type="checkbox"/> Confidential</p>			
		 			

Your ref.  
Our ref. 5120814/10.00/OC749/DS/KP/fl

Date: 29 July 2014

**By e-mail and Post**

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**Attn: Mr. Brian KAM**  
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Dear Sirs

**Contract No. HY/2012/07**  
**Tuen Mun - Chek Lap Kok Link**  
**Southern Connection Viaduct Section**  
**EM&A Manual Section 6.3 - Design Phase Audit**

With reference to Item 7, Table 6.1 of the EM&A Manual, we write to confirm Atkins China Limited as the Design Auditor have received the below submission. Any future engineering design submission will be reviewed against the subject submission.

- Proposal for Submission of Dolphin Exclusion Zone Specification – 24 July 2014

Please do not hesitate to contact the undersigned or our Kan Pang at 2972 1925

**Yours faithfully**  
**for and on behalf of**  
**Atkins China Ltd**



**Sharifah Or**  
**Design Auditor**

Ref.: HYDZHMBEEM00\_0\_2195L.14

28 August 2014

AECOM  
Supervising Officer Representative's Office  
780 Cheung Tung Road, Lantau, N. T.

By Fax (3691 2899) and By Post

Attention: Mr. Daniel Ip

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/2012/07 TM-CLKL Southern Connection Viaduct Section  
Specification for Dolphin Exclusion Zone**

Reference is made to the Specification for Dolphin Exclusion Zone certified by the ET Leader (ET's ref.: "0215660 MMEZ Specifications Rev a\_2014\_06\_25.pdf" dated 24 July 2014) and provided to us via email on 26 August 2014.

We are pleased to inform you that we have no adverse comments on the captioned Specification.

Thank you for your kind attention. Please do not hesitate to contact the undersigned or the ENPO Leader Mr. Y. H. Hui should you have any queries.

Yours sincerely,



F. C. Tsang  
Independent Environmental Checker  
Tuen Mun – Chek Lap Kok Link

c.c. HyD – Mr. Stephen Chan (By Fax: 3188 6614)  
HyD – Mr. Matthew Fung (By Fax: 3188 6614)  
AECOM – Mr. Conrad Ng (By Fax: 3922 9797)  
ERM – Mr. Jovy Tam (By Fax: 2723 5660)  
Gammon – Mr. Roy Leung (By Fax: 3520 0486)

Internal: DY, YH, ENPO Site

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# 1 INTRODUCTION

## 1.1 BACKGROUND

According to the findings of the Northwest New Territories (NWNT) Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway would be operating beyond capacity after 2016. This forecast has been based on the estimated increase in cross boundary traffic, developments in the Northwest New Territories (NWNT), and possible developments in North Lantau, including the Airport developments, the Lantau Logistics Park (LLP) and the Hong Kong – Zhuhai – Macao Bridge (HZMB). In order to cope with the anticipated traffic demand, two new road sections between NWNT and North Lantau – Tuen Mun – Chek Lap Kok Link (TM-CLKL) and Tuen Mun Western Bypass (TMWB) are proposed.

An Environmental Impact Assessment (EIA) of TM-CLKL was prepared in accordance with the EIA Study Brief (No. ESB-175/2007) and the *Technical Memorandum of the Environmental Impact Assessment Process (EIAO-TM)*. The EIA Report was submitted under the Environmental Impact Assessment Ordinance (EIAO) in August 2009. Subsequent to the approval of the EIA Report (EIAO Register Number AEIAR-145/2009), an Environmental Permit (EP-354/2009) for TM-CLKL was granted by the Director of Environmental Protection (DEP) on 4 November 2009, and EP variation (EP-354/2009A) was issued on 8 December 2010. Another application for variation of environmental permit (VEP) (EP-354/2009/B) was granted on 28 January 2014.

As per *Clause 3.1* of the EP of TM-CLKL (EP-354/2009/B), a dolphin exclusion zone (DEZ) of 250m should be implemented around the work areas of the Project for the dredging, reclamation or sheet piling works in order to mitigate the potential acoustic disturbance to dolphins caused by the works. The Environmental Monitoring and Audit (EM&A) Manual of the Project also requires the implementation of DEZ for bored piling works in addition to the aforementioned types of works.

## 1.2 SCOPE OF THE CONTRACT

Under *Contract No. HY/2012/07*, Gammon Construction Limited (GCL) is commissioned by the Highways Department (HyD) to undertake the design and construction of the section of TM-CLKL connecting the southern landfall of TM-CLKL and North Lantau Highway (NLH) near Tai Ho Wan, including the following:

- A dual 2-lane main marine crossing (Structures E2, E5, E6, E7 and E8) across the sea between the southern landfall of TM-CLKL and NLH;
- Five link or slip roads (Structures F1, F2, F3, F4 and F5) at the southern landfall of TM-CLKL connecting a dual 2-lane rural trunk road (main

marine crossing) in (i) above with the HKBCF and the TM-CLKL Northern Connection Sub-sea Tunnel Section;

- Four link roads (Structures E1, A1, A2, B1, B2, B3, C1, C2, C3, C4, D1, D2, D3 and D4) at North Lantau connecting the main marine crossing in (i) above with the NLH ;
- Associated civil, structural, geotechnical, marine, environmental protection, landscaping, drainage, highway electrical and mechanical (E&M) works, street lightings, traffic aids and sign gantries, marine navigational aids, ship impact protection system, water mains and fire hydrants, lightning protection system, SHMS, as well as operation and maintenance provisions of viaducts, provisioning of facilities for installation of TCSS, provisioning of facilities for installation of telecommunication cables/equipment and reprovisioning works of affected existing facilities/utilities; and
- Incidental works thereto the above and other associated works which are shown on the Drawings or specified in the Contract.

The above scope of works would involve bored piling and temporary staging piling. There will not be any sheet piling, dredging and reclamation works under the Contract.

Preliminary layout plan of the pier sites of the Contract, which is relevant to the implementation of DEZ, is presented in *Figure 1.1*.

### 1.3

#### **PURPOSE OF THIS SPECIFICATION**

This Specification for Dolphin Exclusion Zone has been prepared by ERM-Hong Kong, Limited (ERM) on behalf of GCL to present the methodology of implementation of DEZ for daylight hours <sup>(1)</sup> under the Contract, including bored piling works, in accordance with *Section 6.3.1.1* of the EM&A Manual <sup>(2)</sup>. The specification also covers piling works for the installation of temporary staging of the Contract.

(1) Daylight hours will be defined in accordance with definitions provided by the Hong Kong Observatory.

(2) AECOM (August 2009) EM&A Manual of Tuen Mun - Chek Lap Kok Link (Register No.: AEIAR- 146/2009). Prepared under Agreement No. CE 52/2007 (HY).



Figure 1.1

Layout of Temporary Staging Platforms

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## 2.1 RELEVANT REQUIREMENTS OF DEZ

According to recommendation of the approved EIA Report, a dolphin exclusion zone should be implemented in order to alleviate the potential acoustic disturbance to Chinese White Dolphins (*Sousa Chinensis*). Requirements on the implementation of DEZ during daylight hours are presented in the approved EIA Report <sup>(1)</sup>, EM&A Manual <sup>(2)</sup> and subsequently *Clause 3.1* of EP-354/2009/B, which are summarized below:

- A dolphin exclusion zone of 250m should be implemented around the work areas. The dolphin exclusion zone should be monitored by independent dolphin observers with an unobstructed, elevated view of the area. Dredging, bored piling and sheet piling works would not be allowed to begin until the observer certifies that the area is continuously clear of Chinese White Dolphins for a period of 30 minutes
- Dredging, bored piling and sheet piling works should, also, cease if Chinese White Dolphins move into the exclusion zone/area during these activities and works should not start again until the observer has confirmed that the area is continuously clear of Chinese White Dolphins for a period of 30 minutes.
- The observers must be suitably trained in biology and should be independent of the Contractor and should form part of the independent Environmental Team (ET) to be employed by the Contractor. An Independent Environmental Checker (IEC) would be required to audit the work of the ET. An important aspect of applying this mitigation technique effectively is that the observer should have the power to call-off construction activities to monitor the exclusion zone.

The above requirements are taken into account for the development of methodology of DEZ monitoring presented in *Section 2.2* below.

## 2.2 METHODOLOGY

### 2.2.1 Implementation Period

The requirement of DEZ will be implemented when bored piling works are being undertaken within the works area. In addition, DEZ will also be implemented during the piling works for the construction of the temporary staging under the Contract which is a mitigation measure recommended in the Environmental Review of the temporary staging <sup>(3)</sup>. The period of DEZ

<sup>(1)</sup> AECOM (August 2009) *Op. cit.*

<sup>(2)</sup> AECOM (August 2009) *Op. cit.*

<sup>(3)</sup> ERM (October 2013) Environmental Review for the Temporary Staging for Construction of the Southern Connection.

implementation should be reviewed with reference to the progress of the construction works.

### 2.2.2 *Deployment Location of Dolphin Observers*

Trained dolphin observers from the ET will be deployed at the site to monitor the DEZ. In accordance with relevant requirements presented in *Section 2.1* above, the DEZ will cover a radius of 250 m from the works area of bored piling and temporary staging piling. The dolphin observers will be stationed onboard derrick barges (*Figure 2.1*), which has a higher air draft when compared to other works vessel, in order to obtain an unobstructed, elevated view of the DEZ. The derrick barge selected for the DEZ monitoring will be reviewed based on actual location of the barges relative to the distribution of other works vessels at the site. Should location other than a derrick barge be identified as a better viewing platform in terms of providing unobstructed, elevated view of the area, it will also be considered for use. Coordinates of the selected derrick barges/viewing platform will be included on the sighting records.

A small vessel should be available at all times to support the DEZ monitoring (eg for the dolphin observers to approach the observed dolphin(s) for any necessary detailed observations).

**Figure 2.1** *Photo and General Information of Derrick Barge*

Vessel Details	Photo
Length: 47m Breadth: 20m	

The estimated number of dolphin observers required is provide in *Figure 2.2* with reference to the preliminary construction schedule of the pier sites. During the estimation, the number of pier site/temporary staging platform that will be constructed concurrently and their separation distance have be considered to ensure that there will be a dolphin observer covering each work front which may comprise more than one pier site/temporary platform/staging in close vicinity to each other. The dolphin observer will be stationed on a derrick barrage which can provide an unobstructed view of the DEZ for each work front. The actual number of dolphin observers deployed may vary depend on actual progress and conditions of construction works.

Figure 2.2 Estimated Number of Dolphin Observers during Marine Construction Works at Different Pier Sites

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<b>Viaduct</b>	<b>Piers</b>	<b>Estimated No. of Dolphin Observers</b>
A	A1 - A7	1
B	B1 - B7	1
C	C1 - C6	1
D	D1 - D7	1
E	E1 - E13	1 to 5

Remarks:

- (1) The estimated number of Dolphin Observers is based on the tentative construction programme provided by the Contractor which is subject to change after review with the latest construction programme.
  - (2) Dolphin Observers can have an observation circle of 250m in radius provided views are not being obstructed.
-

Additional dolphin observers will be deployed if deemed necessary to ensure effective monitoring of the DEZ.

*Figure 2.3* indicates the maximum extent of the DEZ assuming works will be undertaken along the entire alignment of the marine viaduct. Given that the dolphin observers would have a field of view of 500m from the observation point, a maximum number of six (6) dolphin observers will be required to monitor the maximum extent of the DEZ according to current implementation plan which should be considered adequate as illustrated in *Figure 2.3*.

### 2.2.3 *Implementation of DEZ before and during Works*

Qualified dolphin observers will stand on the open upper deck of the derrick barge / viewing platform, allowing for relatively unobstructed elevated view of the DEZ (ie within a radius of 250 m from the works vessels which are engaged in bored piling and temporary staging piling works). Qualified observer will scan the 250 m exclusion zone, including waters underneath the temporary staging platforms, for at least 30 minutes prior to the start of relevant works. If dolphin is observed in the exclusion zone, bored piling / temporary staging piling will be delayed until they have left the DEZ. This measure will confirm that the area in the vicinity of the bored piling / temporary staging piling works is clear of dolphin prior to the commencement of works and will serve to reduce any potential disturbance to dolphin.

In case dolphin is observed within the exclusion zone during bored piling / temporary staging piling works, the relevant part of the works should cease and works should not be started again until the observer has confirmed that the area is continuously clear of dolphin for a period of 30 minutes.

The dolphin observer will communicate any instruction to other works vessels through the skipper onboard the derrick barge where the observer is stationed. Should dolphin is observed by other vessel crews during works, the observation should be communicate to the observer through the same skipper. The observer should then instruct to delay starting of or cease works if necessary.

In the event that a Chinese White Dolphin, or other marine mammal, is found injured or dead within the DEZ, the Agriculture, Fisheries and Conservation Department (AFCD) should be contacted at the government 24-hour hotline (i.e. 1823) to seek assistance from the corresponding responsible team of AFCD.

### 2.2.4 *Reporting*

Reports on DEZ monitoring, eg sighting records, should be submitted to the IEC/ENPO within 10 working days from the end of the previous reporting month. The sighting record will be in the form a log-sheet recording the initial sighting time, position, distance and angle data of the sighted dolphin. Other information on sea state, weather conditions (Beaufort scale), as well as notes on dolphin appearance, behaviour, direction of movement, response to vessel, group size, etc can also be recorded.

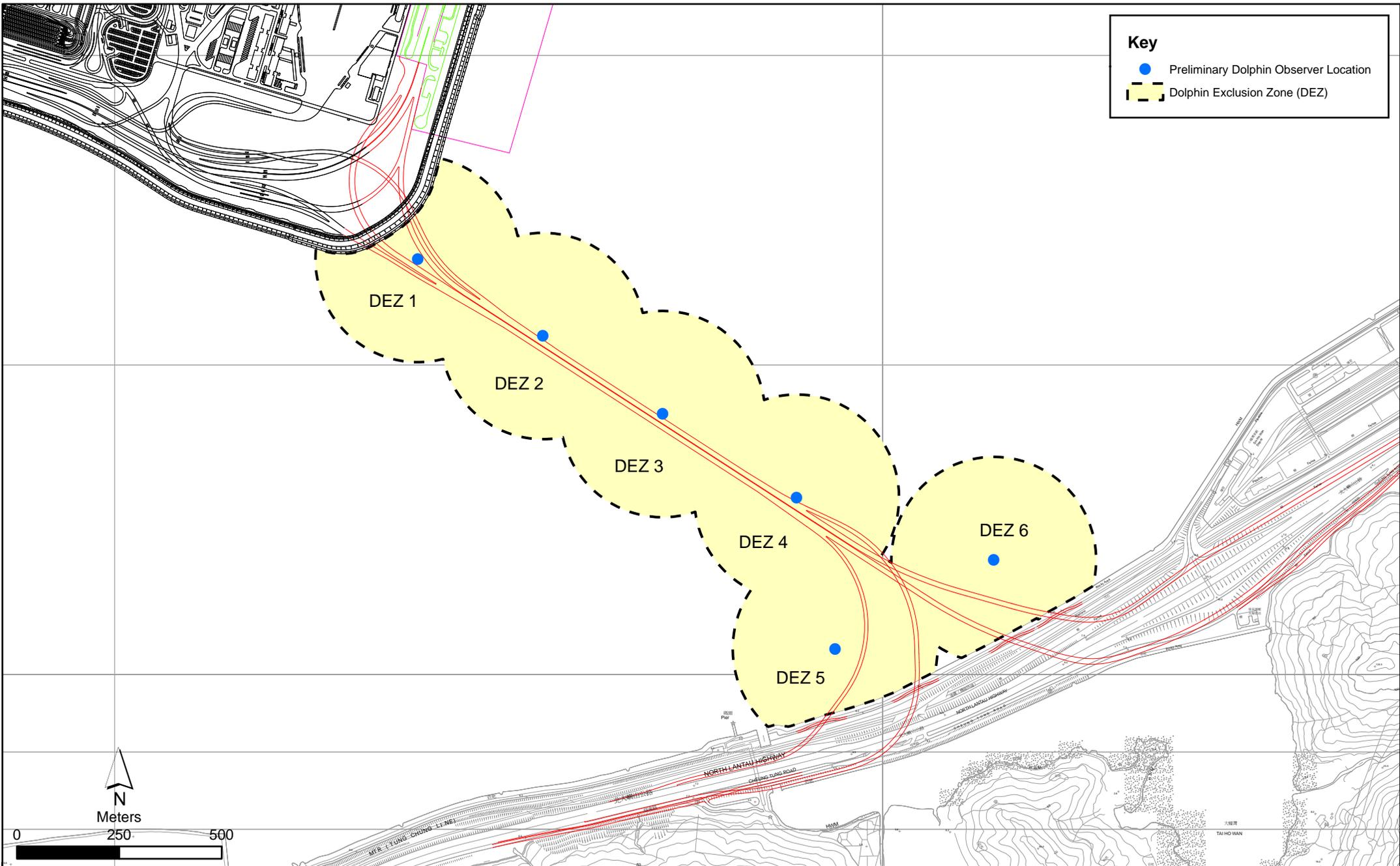


Figure 2.3

Maximum Extent of Dolphin Exclusion Zone  
and Preliminary Location of Dolphin Observers

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A Dolphin Intrusion Report will be provided to the SOR, IEC/ENPO and the dolphin specialist (Dr Samuel Hung) within three working days after each incidence of CWD intrusion/presence within the DEZ. The CWD Intrusion Report will include date, time, position and number of CWD observed, a chronological list of actions taken, with time, by the observer(s) and construction workers.

A flowchart showing the communication procedure is shown in *Figure 2.4*.

### 2.3

#### *TRAINING OF DOLPHIN OBSERVERS*

All dolphin observers will be suitably trained by the dolphin specialist (Dr Samuel Hung) in accordance with requirements of the EM&A Manual. Training materials and schedule will be submitted to the Environmental Protection Office (ENPO) and the IEC of the Project prior to the start of training for their records. Training records/certificates of dolphin observers will also be submitted to ENPO/IEC and SOR for records. Trained dolphin observers should attend refreshment training conducted by the dolphin specialist on an annual basis.

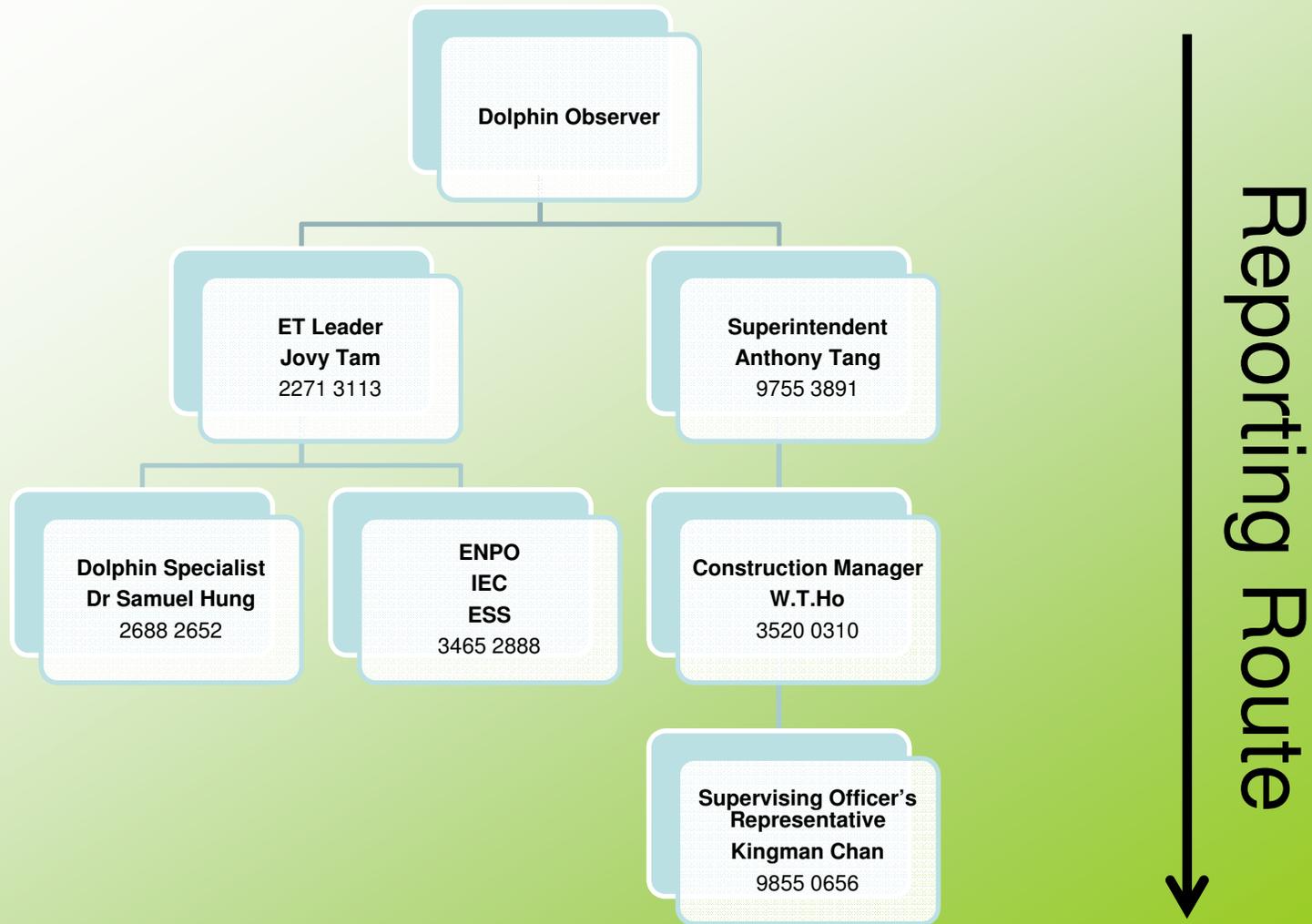


Figure 2.4

Flow Chart of Reporting Route



### **CONCLUSION**

In accordance with recommendation of the approved EIA Report and requirements of the EP-354/2009/B and EM&A Manual of the Project, this Specification for Dolphin Exclusion Zone has been prepared to present the methodology of implementing DEZ for works during daylight hours, including bored piling and temporary staging piling works, of the Contract. This specification covers the observation period, location, implementation and reporting for the DEZ monitoring as well as training requirements of the qualified dolphin observers which will be followed during the construction works of the Contract.