中國港灣工程有限責任公司
香港代表： 振華工程有限公司
CHINA HARBOUR ENGINEERING COMPANY LIMITED
HONG KONG REPRESENTATIVE: ZHEN HUA ENGINEERING CO., LTD.

Date : 28th February 2012
Our Ref. : CHEC/C273/01.15/000420

Ove Arup & Partner (Hong Kong) Ltd
Level 5, Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong, Kowloon, Hong Kong

Attn.: Mr. Michael Lo

Dear Sir,

Contract No. HY/2010/02
Hong Kong Zhuhai Macao Bridge
Hong Kong Boundary Crossing Facilities – Reclamation Works
Submission of Plan Showing the Regular Marine Travel Routes of Vessels To and From the Work Sites

In accordance with the condition 2.8 of EP-353/2009/C and condition 2.8 of EP-354/2009/A (only for TM-CLKL Southern Landfall Reclamation), we are pleased herewith to provide 7 hard copies and 1 soft copy of the captioned plan in which certified by ET and verified by IEC for your record and onward submission to EPD.

Thank you for your kind attention.

Yours faithfully,
For and on behalf of
China Harbour Engineering Company Limited

Shum Hong Sang
Project Manager

Encl.

SHS/DC/WCM/sy

c.c.	Arup	Dr. K.K. Yin (The Engineer)	
	AECOM/ET	Ms. Echo Leong	cover only (fax: 2317 7609)
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By Fax (2578 0413) and E-mail (chiming.wong@chechkbcf.com)

China Harbour Engineering Company Limited
19/F., China Harbour Building,
370-374 King's Road,
North Point,
Hong Kong.

Attn: Mr. SHUM Hong-sang

25 February 2012

Dear Sir,

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

Certification of Regular Marine Travel Routes Plan (Rev. 0)

Reference is made to the Regular Marine Travel Routes Plan (Rev. 0) submitted by you via e-mail dated 25 February 2012.

We hereby certify the captioned plan as in compliance with the condition 2.8 of Environmental Permits No. EP-353/2009/C and condition 2.8 of Environmental Permits EP-354/2009/A (only for TMCLKL Southern Landfall Reclamation), for your onward submission.

Should you require any further information, please do not hesitate to contact our Ms. Edith Ng at 3922 9407.

Yours faithfully,

For and on behalf of
AECOM Asia Co. Ltd.

Echo Leong
Environmental Team Leader

MEINHARDT
Consulting Engineers • Planners • Managers
工程設計、策劃、統籌

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Our Ref.: HJC/HYH/14985/91259B.304/mw
Date: 27 February 2012

By Fax (2512 0427) & Post

China Harbour Engineering Company Ltd
19/F, China Harbour Building
370 – 374 King's Road
North Point
Hong Kong

Attn.: Mr. Shum Hong Sang

Dear Sirs

Re: Agreement No. HHZMB 1/2011 (EP)
Independent Environmental Checker for
Baseline Environmental Monitoring for
Hong Kong-Zhuhai-Macao Bridge Hong Kong Projects
Extended Services: Interim ENPO

Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities – Reclamation Works
Regular Marine Travel Routes Plan

We refer to your letter dated 27 February 2012 (your ref.: CHEC/C273/10.03/000416) enclosing a copy of the Regular Marine Travel Routes Plan (Rev.0) and the ETL certification dated 25 February 2012 (ref.: C/lchc12022502).

We are please to verify the captioned Plan is in compliance with EP 353/2009C and EP 354/2009/A (only for TM-CLKL Southern Landfall Reclamation).

Should you have any queries, please do not hesitate to contact the undersigned.

Yours faithfully
MEINHARDT ENVIRONMENT LIMITED

HUI Yuk Hung
Independent Environmental Checker - HKBCF

c.c. : HyD – Mr. Bill Chan (By fax only: 3188 6614)
ARUP – Dr. K. K. Yin (By fax only: 2865 6493)
ARUP – Mr. Michael Lo (By fax only: 2268 3970)
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CHEC – Mr. C. M. Wong (By fax only: 2578 0413)

Distn. : HJC HYH AMY

CHINA HARBOUR ENGINEERING COMPANY LIMITED HONG KONG REPRESENTATIVE: ZHEN HUA ENGINEERING COMPANY LIMITED		
	CONTRACT NO. HY/2010/02 HONG KONG-ZHUHAI-MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES – RECLAMATION WORKS	Document No. RMTR-001 Revision 0

Regular Marine Travel Routes Plan

Rev.	Date	Status	Prepared By Environmental Officer	Reviewed By Engineering Manager	Reviewed By Project Manager
0	22-Feb-12	For EP Submission			

Note: This plan is a controlled document and is under the control of the Project Manager. Alterations of this document are not permitted without prior approval of the Project Manager. It is the responsibility of the holder to ensure that his copy is up dated by the inclusion of all revisions. Should there be any queries concerning the current status of any parts of the documents, please feel free to consult the Engineering Manager.

REVISION HISTORY					
REV	**REV DATE**	**DESCRIPTION OF CHANGE**	**PREPARED BY**	**REVIEWED BY**	**APPROVED BY**
0	22-Feb-12	For EP Submission	EO	EM	PM

CONTENTS

1.0 PROJECT INFORMATION

1.1 Scopes of Project

The HKBCF and TM-CLKL Southern Landfall is located on an artificial island at the waters off the northeast of the Hong Kong International Airport (HKIA), connecting Zhuhai and Macao via the HKLR and HZMB Main Bridge. The HKNCF also connects to the HKIA as well as Northwest New Territories and North Lantau via the TM-CLKL.

The project scope of this Project includes:

- Construct 6km long cellular seawall including revetment and deposition of dredged sediment;
- Reclaim 150 ha of land up to +5.5mPD by using of sand and public fill material;
- Construct 4 nos of box culverts and extend one existing drainage outfall from the eastern cost of airport island;
- Apply reclamation treatment to control the residual settlement below 500mm during the design life;
- Operate sorting facilities in Tseung Kwan O Area 137;
- Collect public fill from designated barging points in Hong Kong;
- Delivery of sandfill material from Pearl River Estuary; and
- Delivery of semi-prefabricated sheet pile segment from Zhuhai to HKBCF site.

1.3 Purposes of Regular Marine Travel Routes (RMTR) Plan

The location of HKBCF is carefully chosen and avoid Chinese White Dolphin (CWD) major active areas which are mainly on the western waters off the Airport Island or between Sha Chau / Lung Kwu Chau and Fan Lau.

However, the potential of a cumulative marine traffic disturbance or collision risk due to the work-related vessel traffic flow during construction phase is considered in Ecological Impact for this Project. Therefore, proper control of marine traffic disturbance on CWD, such as speed limits and regular routes, will be applied as the mitigation measures to minimize impacts of CWD during construction stage.

This plan presents the design principal, implementation and monitoring method for RMTR.

1.4 Structure of Regular Marine Travel Routes Plan

Following this introductory sections, the remainder of the report is presented as follows:

- *Section 2* presents the Design Criteria of Regular Marine Travel Routes Plan;
- *Section 3* presents the Implementation and Monitoring of Regular Marine Travel Routes Plan; and
- *Section 4* is the Summary and Conclusion

2.0 DESIGN OF REGULAR MARINE TRAVEL ROUTES

The following paragraphs presents the introduction of construction activities and particular of working vessels that will allocated in this Project in order to identify the potential risks / impacts

and mitigation measures to minimize impacts to CWD during the construction stage.

2.1 Method of Construction

a) Seawall Construction

There are three main types of seawalls will be constructed along the boundary of HKBCF including:

- Sloping Seawall in Portion D
  This is a revetment seawall mainly made up of natural rockfill material supported by stone columns. Derrick barge with hopper for storing material will be generally used for constructing of sloping seawall. Moreover, flat-topped barge equipment with crawler crane and hopper barge can also be used for sloping seawall construction. The barges used for this type seawall construction are non-self-propelled and tug boat is required to assist traveling and maneuvering in Hong Kong Waters.

- Blockwork Seawall in Portion D
  This is a vertical seawall made up of mass concrete seawall block also supported by stone column. The working barges for this type seawall are same as sloping seawall construction.

- Cellular Structure Seawall in other Portions
  The construction of cellular structure seawall can be divided into two phases – steel sheet pile cell and revetment. Two installation methods, namely in-place and semi-prefabricated method will be adopted in order to suit for site constraints such as shallow water, airport height restriction requirement, etc.

  For the in-place method, sheet piles will be delivered to Work Area WA 4 or Zhuhai for steel work modification. Afterward these material will be upload to the derrick barges or flat-topped barges to tow the designated location for installation. Template will be installed on-site for the assembling sheet piles one-by-one to form a complete cellular structure. After driving cellular structure to the design level, template will be removed. The above-mentioned steps will be carried by either derrick barges or flat-topped barges. Afterward, cellular structure will backfilled with dredged sediment or public fill or sandfill by derrick barges, or flat-topped barges or pelican barges.

  For the semi-prefabricated method, sheet pile will be assembled into a quarter segment and delivered to HKBCF site for installation. Large flat-topped barge and tugs for delivering semi-fabricated cellular structure segment are required. When the segment is delivered to site, special crane barge will be used to unload the segments from large flat-topped barge. Afterward, the special crane will assemble and install the cellular structure onsite. After driving cellular structure to the design level, the following installation procedures will be same as in-place method.

  After cellular structure is installed and backfilled with suitable material, revetment can be constructed as similar as sloping seawall construction.

b) Reclamation and Surcharging

The reclamation works are divided into two stages, namely underwaterfill (below +2.5mPD)

and earthworks fill (up to formation level +5.5mPD).

The underwaterfill mainly are sandfill material with maximum 30% of public fill while cellular structure seawall are completed except marine access opening. The placement of underwater fill will be executed by pelican barges flat-topped barges with crawler crane and hopper barges.

The earthwork fill will be sandfill material in Portion A, D and Part of B, and the remaining Portions are the public fill material. The delivery of earthwork fill material will be made use of marine fleets including pelican barges, derrick barges and flat-topped barges with crawler crane. The backhoes, excavators and lorry trucks will be used for spreading and building up earthwork fill to the design formation levels.

Surcharge fill are mainly public fill with small quantities of sandfill which is the preset of earthwork fill owning to consolidation settlement effect. After surcharging work is completed, the surplus material will be uploaded to the derrick barges and flat-topped barges for the disposal of to proper fill bank facilities.

c) Stone Column Installation Works

The quantities of stone column are quite significant that required numbers of special barges to catch up the construction programme. One of our solutions to minimize the number of marine fleets is to equip maximum four sets of vibrolances on a flat-topped barge. Based on aforementioned set up, one derrick barge or flat-topped barge equipped with excavator will be used as material storage onsite. The stone material will be delivered to site by pelican barges and uploaded to the material storage barge. At the construction peak, five sets stone column installation team will be allocated for catching up the tight installation programme.

d) Dredging Works and Temporary Storage Area for Dredged Sediment

The volume of dredged sediment is relatively insignificant but requires to re-deposition onsite. Closed bucket dredger and derrick barges will be allocated for dredging marine sediment and re-depositioning onsite respectively.

e) Culverts Construction in Portion D

Four culverts will be cast in Zhuhai and delivered segment-by-segment to site by semi-submersible barges to site for installation.

f) Other Marine Based Construction Activities

Other marine based construction activities include installation of vertical drain, laying of geotextile, placing of stone blanket and sand blanket, etc. These works will be carried out by derrick barges and flat-topped barge equipped with excavator. And the material such as sandfill and stone will be delivered to site by using of pelican barges. Maneuvering and anchoring of working fleets will be assisted by tug boats and anchor boats.

g) Site Investigation

Flat-topped barges are the main work fleeting for the site investigation work in the vicinity of HKBCF site.

h) Storage Yards in Works Areas WA2 and WA4

Two small scale storage yards are set up near to the HKBCF, namely WA2 and WA4. Geotextile, vertical drain and silt curtain, steel members and sheet piles, etc. will be stored in WA2 and WA4 which material will be delivered to working areas by derrick barges and flat-topped barges equipped with excavator. Small quantities of public fill generated from XRL project is stored in WA4 and will be depostioned in HKBCF as earthwork fill by derrick barges and flat-topped barges.

i) Marine Access Facilities in Works Areas WA2 and WA4 and HKBCF Site

Marine access points will be set up in Works Areas WA2 and WA4 for the purposes of routine marine transportation to site staff, material and consumables. Transportation boats, sampans and small tug boats will use these facilities for carrying site staff.

j) Other Marine Based Project Related Working Activities

Other marine based working activities including site investigation, surveying, water qualities monitoring, dolphin monitoring, patrolling, marine traffic control, emergency measures, and the like will be carried out onsite. Transportation boats, sampans and small tug boats will use these facilities for carrying site staff.

2.2 Types of Working Vessels

The ship particulars of different types of working fleets deployed for the construction of HKBCF are attached in the Appendix A. Considering potential impact to CWD, these working fleets can be divided into three categories:

a) Non-self-propelled Working Fleets in the vicinity of HKBCF site

The working fleeting classed in this category include derrick barges, flat-topped barges, special crane barges, geotextile laying barge (modified by flat-topped barge), etc. Tug boats and anchor boats will be used to tow and to assist the positioning and anchoring. As these working fleets will mainly station within HKBCF boundary and the maneuvering or positioning will be carried out in slow speed, the potential impact to CWD will be low.

b) Self-propelled Working Fleets in the vicinity of HKBCF site

The working fleeting classed in this category include tug boats, anchor boats, passenger boats, sampan and pelican barges. As the construction activities are mainly carried out in the vicinity of HKBCF site, and since most of working fleets will be slow-moving (around 5 knots up to maximum 10 knots), therefore traffic disturbance or collision risk will be low in this cases.

c) Delivery material to HKBCF reclamation project

The working fleeting classed in this category include tug boats, anchor boats, passenger boats, sampan and pelican barges. The potential of a cumulative marine traffic disturbance or collision risk due to the large-sized and slow-moving (around 5 to 10 knots) working fleets traffic flow during construction stage will affect the CWD. Therefore, controlling of marine traffic

disturbance on CWD such as speed limits and regular routes will be implemented.

2.3 Design Criteria of Regular Marine Travel Routes (RMTR)

The design criteria of RMTR are summarized as follows:

a) Hotspots of Chinese White Dolphin in Brothers Island

Latest available data of monitoring of marine mammals in Hong Kong Waters collected under the Project and issued by Agriculture, Fisheries and Conservation Department will be used as reference information to align the marine travel routes of project related work fleets. The fundamental principle is that the routes will not go through the dolphin hotspots in Brothers Island.

b) Existing Navigation Channel and Marine Traffic

Further to the safe navigation requirement in-law and the enclosed Figure 2 Existing Fairway Plan, the design of marine travel routes will be followed. Existing fairways such as Hung Hom Fairway, Central Fairway, Northern Fairway and Ma Wan Fairway as well as Urmston Road Channel will be selected as the main travel routes for delivery of material to HKBCF site.

Attached Figure 3 – Existing Marine Traffic Plan shows the existing traffic flow in the vicinity of HKBCF site and Urmston Road Channel. Due to such large volume of marine traffic, the project related working fleets are required to draw extra attention and safety awareness while passing through this region. The marine travel routes will be locally adjusted so as to minimize the potential risks of marine traffic incident.

c) Practice of Navigation Safe

The licensed captain is the authorized person to control the working fleeting under safe marine operation. He will follow all safe navigation requirement and international practice with assistance from navigation aids as well as support from marine traffic control team of Marine Department.

The marine travel route will be adjusted locally to cater for any incident so as to ensure safe navigation. For example, containership will occupy Ma Wan Channel and Urmston Road Channel, therefore small project related working fleets needs to “give way” to such large-sized oceangoing vessels when the travel routes are overlapped. Other marine operators such as speed boats, turbo jets, container vessels, river trade vessels and the like may also affect the marine travel routes of project related working fleets.

Marker buoys and navigation buoys are the best marine based indicators to demarcate the proper navigation channel and are very useful tool to assist captain to determine the proper travel routes under real situation and any unexpected incidents.

Moreover, the navigation will also be affected by natural constraints such as wind, current, wave, etc. which may also affect the marine travel routes locally.

d) Restricted Areas and Height Restriction of Hong Kong International Airport

Further to Figure 1 Airport Height Restriction and Airport Restricted Area, there are seven restricted areas in the vicinity of Hong Kong International Airport where working fleets are not allowed to pass through unless authorization is granted. Moreover, the airport height restriction limit will also govern the marine travel routes of working fleets for the delivery of prefabricated cellular structure from Mainland China to HKBCF site.

During the delivery of prefabricated cellular structure, the air draft of working fleet will be around +45mPD which exceeds the limit of airport height restriction requirement. Therefore, the route cannot go directly from north to HKBCF site. Having considered the safety requirements of aviation and airport operation, an agreement was made amongst Marine Department, Civil Aviation Department, Airport Authority Hong Kong and Highways Department that the route is realigned to go east direction further until passing over the proposed marine park in Brothers Island, and then turn back to HKBCF. The numbers of trips for this operation will approximate twice a week for ten months from April 2012.

e) Other Site Constraints

Existing marine parks, anchorage areas in Sham Shui Kok and Tuen Mun and the like are also considered during designing the proper marine routes for this Project.

2.4 Selected Regular Marine Travel Routes

Based on the abovementioned designed criteria, the marine travel routes for different construction activities are designed and presented in the following figures.

- ***Figure 4A : Marine Route for Delivery of Public Fill Materials***
- ***Figure 5A : Marine Route for Delivery of Precast and Prefabricated Units***
- ***Figure 6A : Marine Route for General Usage and Passenger***
- ***Figure 7A : Marine Route for Delivery of Sandfill and Rockfill Materials***

The main marine travel routes will be from the north entering to HKBCF site. In order to minimize number of trips passing through those ecological sensitive areas, large storing capacity work fleets will be deployed. In addition, navigation speed for those fleets will be reduced to maximum 5 knots while approaching the region near to marine parks.

However, these marine travel routes will be locally modified for the purpose of catering for the sighting of CWD and safe marine operation under real marine traffic conditions, weather conditions and any unexpected incident.

Concerning the marine travel route of pre-fabricated units from Mainland China to Hong Kong (Figure 5A), this is the most critical route which is governed by different requirements such as marine parks, dolphin hotspots, airport height restriction (AHR) requirement, restricted areas around airport, vessels anchorage areas and existing navigation channel. As mentioned in Section 2.3 d), the air draft of working fleet for delivering prefabricated units will infringe the official AHR if directly entered HKBCF site from northern direction as similar as main marine travel routes. This issue was raised and discussed with different statutory authorities. Eventually it is agreed that prolonged marine travel route to be adopted - go further east until pass over proposed marine park in Brothers Island and turn back to HKBCF site – so as to minimize

potential impact to CWD within Brothers Island Waters. The finalized marine travel route will pass through the south east corner of proposed marine park in Brothers Island therefore precautionary and mitigation measures shall be implemented. The route will shift along the edge of proposed marine parks as much as practical. And the travelling speed will keep not exceeding 5 knots when crossing the edge of the proposed marine park.

3.0 IMPLEMENTATIN AND MONITORING

3.1 Supervision Staff

The Project Director is the ultimate person for minimizing any ecological impacts including dolphin monitoring and marine traffic control. The supervising staff including Project Manager, Construction Manager, Superintendent, Site Foreman and the representative of subcontracts and specialist will assist the Project Director onsite to implement all precautionary and mitigation measures approved by the Statutory Authority and the Engineer.

3.2 Method of Implementation and Monitoring

The construction works are divided into onsite and offsite works. Onsite works include all construction activities in the vicinity of HKBCF site such as seawall construction and reclamation. As the working fleets are mainly stationed within the site boundary and occasionally will be relocated to suit the working progress, the potential impacts to CWD will be low.

Offsite works are mainly the delivery of material such as sandfill and rockfill from Pearl River Estuary, public fill for barging points in Hong Kong, precast or prefabricated unit from Pearl River Estuary. As these working fleets will pass through Urmston Road Channel, marine parks and hotspots of CWD in Northeast and Northwest of Lantau Island, therefore tight marine travel routes control will be implemented.

i) Public fill barges from barging points in Hong Kong
All barges for transporting public fill will be equipped with Automatic Identification System (AIS) for track logging of vessels.

ii) Sandfill and rockfill barges from Pearl River Estuary
GPS system or course recorder system will be installed for the purposes of recording the marine travel route.

iii) Precast and prefabricated unite from Pearl River Estuary
GPS system or course recorder system will be installed for the purposes of recording the marine travel route.

iv) Other project related working fleets
Tug boats will install GPS system or course recorder system for recording marine travel route during tow operation.

The daily record of marine travel route of offsite working fleets will be collected and filed by the supervising staff for inspection and monitoring purposes. Warning will be noticed to the captain and his shipping company or material supplier if vessel track log showed the approved marine travel route is not followed.

3.3 Precautionary Measures

a) Considerations of Operation Procedure

The main issue with the Chinese White Dolphin (Sousa chinensis) is a moving vessel striking and injuring an animal during the period of travel. Information regarding the locations of frequent sighting near the proposed vessel routes indicated that the following would also be needed to minimize the chance of a vessel striking a dolphin.

i) On leaving the entrance in the silt curtain, all vessels will travel at a speed no greater than 5 knots for a distance of 250m then at a speed no greater than 10 knots for a distance of at least 1.5km away. Vessels can then increase speed after that distance unless other restrictions apply.

ii) All vessels travelling on eastern routes will follow a northern heading for at least 2.5 km before turning east. These vessels will also be required to follow the 5 knot speed limit for 250m and 10 knot speed restriction for at least 1.5km of this travel.

iii) When entering the area around Pillar Point, vessels need to slow to a speed no greater than 10 knots when within 2km of this area.

iv) If any dolphins are sighted within 250m of a vessel then the vessel will slow to a speed no greater than 5 knots for at least 3 minutes after the last sighting.

v) The north-western silt curtain entrance will be temporarily blocked off with a section of silt curtain. This will apply until the current dolphin visitation to this area is thoroughly investigated after the installation of the silt curtain.

vi) This will apply until current and up-dated dolphin sighting data is processed by the ET. It is expected that the works and the inclusion of the silt curtain will change the dolphin activity in this area so it may be necessary to modify the above instructions and possibly the routes in the future. The ET will keep the Site Engineer and the Project Team informed of any changes needed

b) Skipper Training

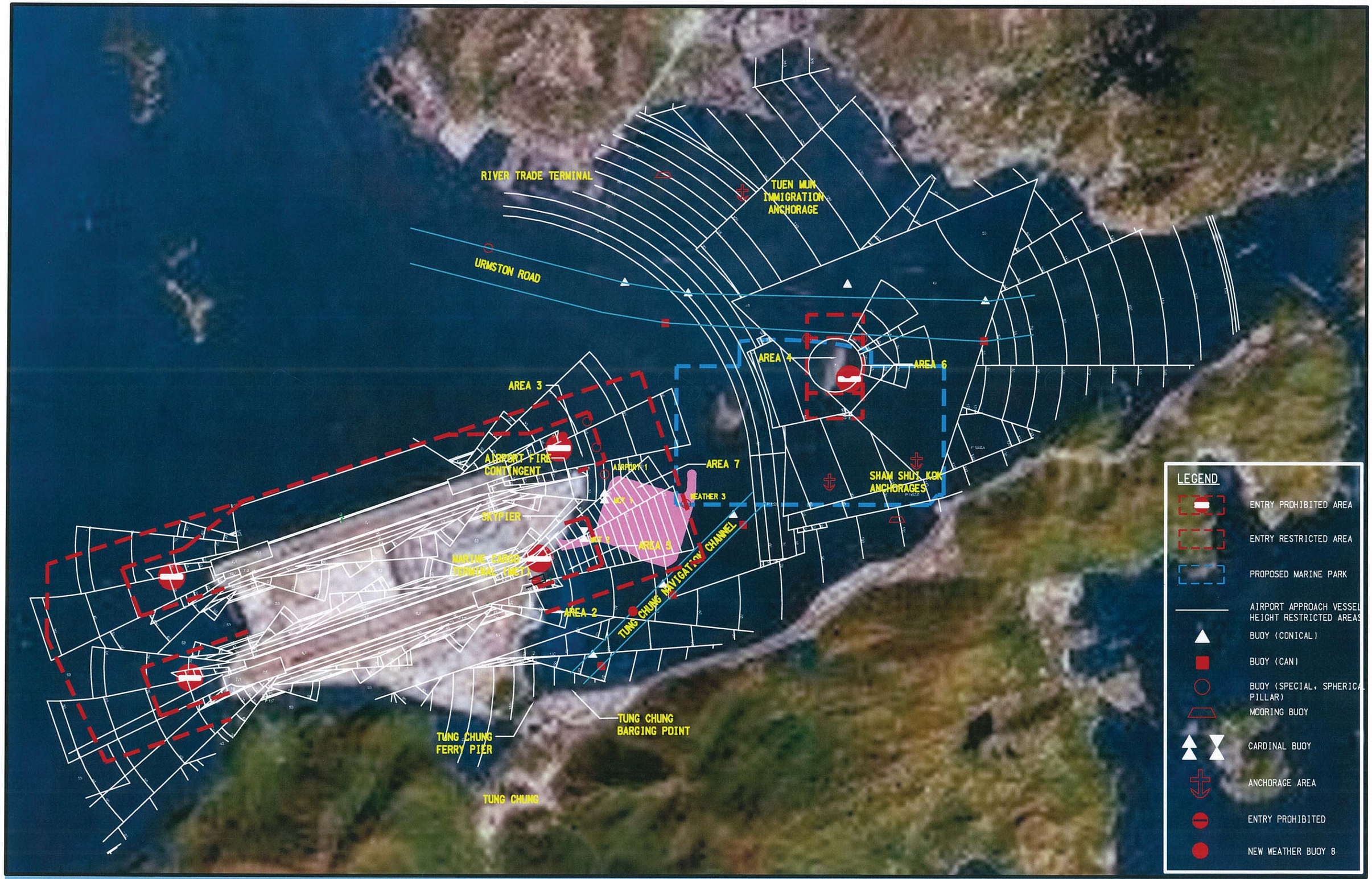
All captains of project related working fleets passing around the West Lantau waters and near the Brothers Islands and the supervising staff should undergo training to learn about local dolphins and porpoises. They should be trained to be aware of the protocol for “dolphin friendly” vessel operation (refer to the Code of Conduct for Dolphin Watching Activities from AFCD). The “To DO and Not to Do Checklist” is attached in Appendix B for more details.

This training course will be provided to captains within three working days after start working onsite and refreshment course will be provided in every quarter. The dolphin specialist will design and prepare training material and update time to time during the course of construction. Moreover, dolphin specialist and / or his assistant with MMO qualification will conduct the training and refreshment courses so as to ensure good practice of dolphin friendly vessel operation.

4.0 SUMMARY AND CONCLUSION

This RMTR Plan presents a review of major construction works, working fleets particulars and design criteria of marine travel routes. Based on this review, preferred marine travel routes for different construction works are recommended. Method of implementation and monitoring as well as precautionary measures are proposed to minimize any potential impacts to Chinese White Dolphin during the course of reclamation works.

Figures



Highways Department
The Government of the Hong Kong Special Administrative Region

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

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AIRPORT HEIGHT RESTRICTION AND AIRPORT RESTRICTED AREA

FIGURE 1

FUI S17F A3

Highways Department
The Government of the Hong Kong Special Administrative Region

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

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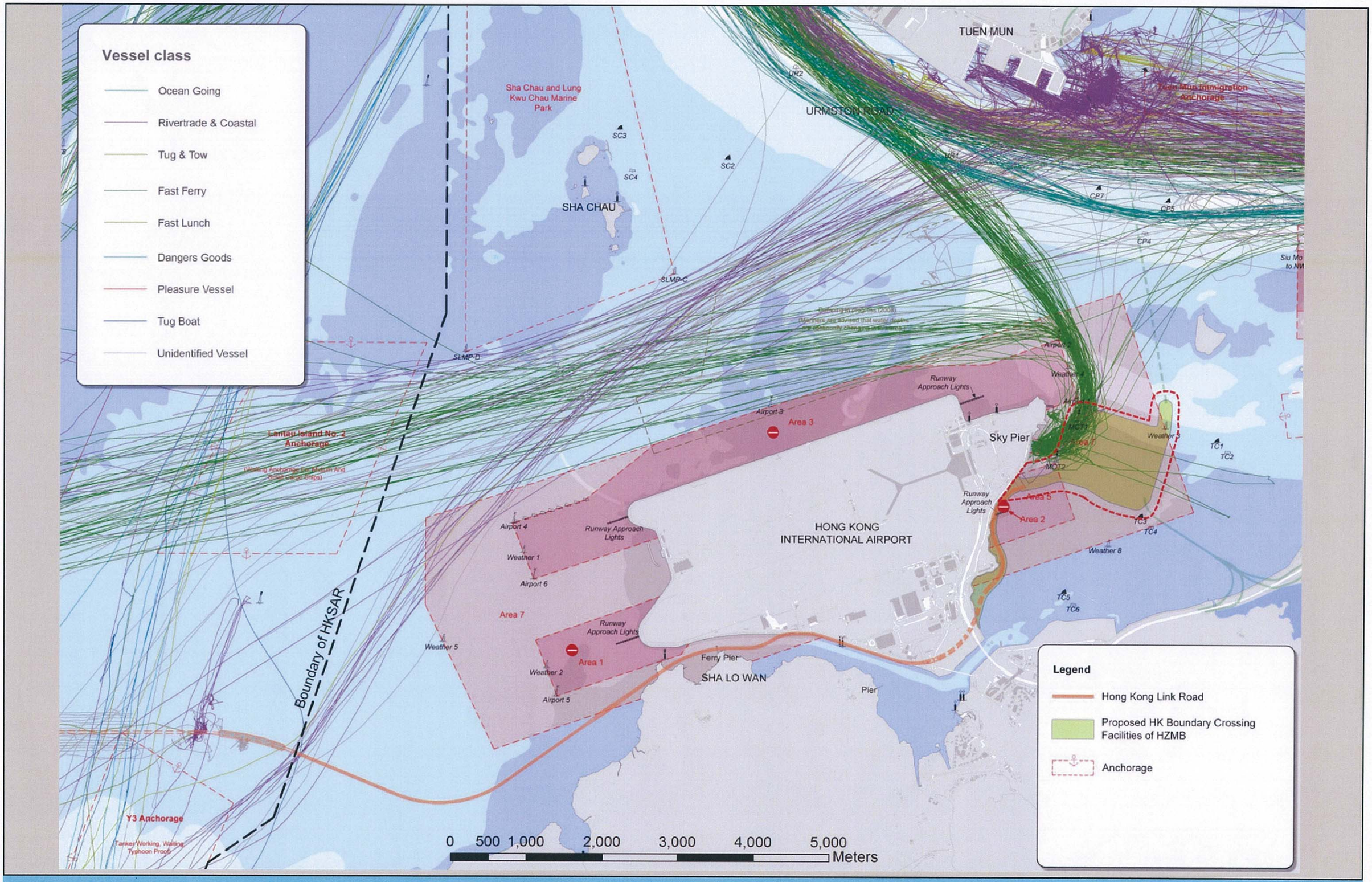
EXISTING FAIRWAY PLAN

FIGURE 2

FUll S17F A3



Highways Department
The Government of the Hong Kong Special Administrative Region

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

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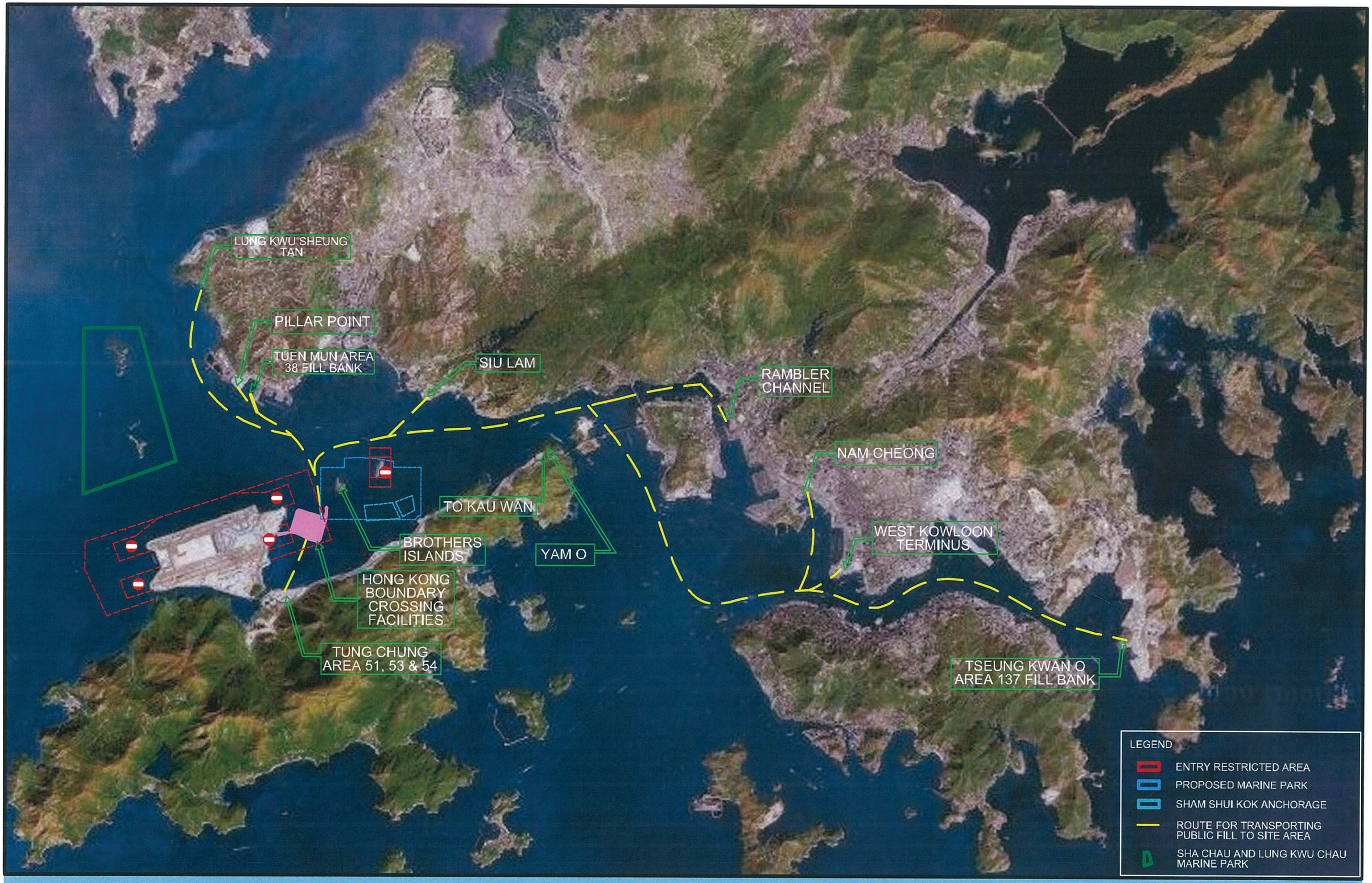
EXISTING MARINE TRAFFIC PLAN

FIGURE 3

FUI1 S17F A3



Highways Department
The Government of the Hong Kong Special Administrative Region

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

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MARINE ROUTE FOR DELIVERY OF PUBLIC FILL MATERIALS

FIGURE 4A

FUII S17F A3

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The Government of the Hong Kong Special Administrative Region

Working Drawings
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Hong Kong - Zhuhai - Macao Bridge
Hong Kong Boundary Crossing Facilities - Reclamation Works

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MARINE ROUTE FOR DELIVERY OF PRECAST AND PREFABRICATED UNITS

FIGURE 5A

FUII S17F A3

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Hong Kong - Zhuhai - Macao Bridge
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MARINE ROUTE FOR GENERAL USAGE AND PASSENGER

FIGURE 6A

FUll S17F A3

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MARINE ROUTE FOR DELIVERY OF SANDFILL AND ROCKFILL MATERIALS

FIGURE 7A

FUI I S17F A3

Appendix A

Working Fleets Particulars

Marine Operations: CPT

Cone Penetration Test

- Stationary Barge will be used within the Site Boundary
- To take samples of the Geotechnical profile for the upcoming seawall and reclamation

Marine Operations: Vessel Particulars

Cone Penetration Test (CPT) - Vessel Particulars

Specification:

CPT Barge

LoA:	33 m
Beam:	12 m
Draught:	1.5 m
Air-draft:	19.5 m

Marine Operations: Vessel Particulars

CPT & Geo-textile laying - Vessel Particulars

Specification:

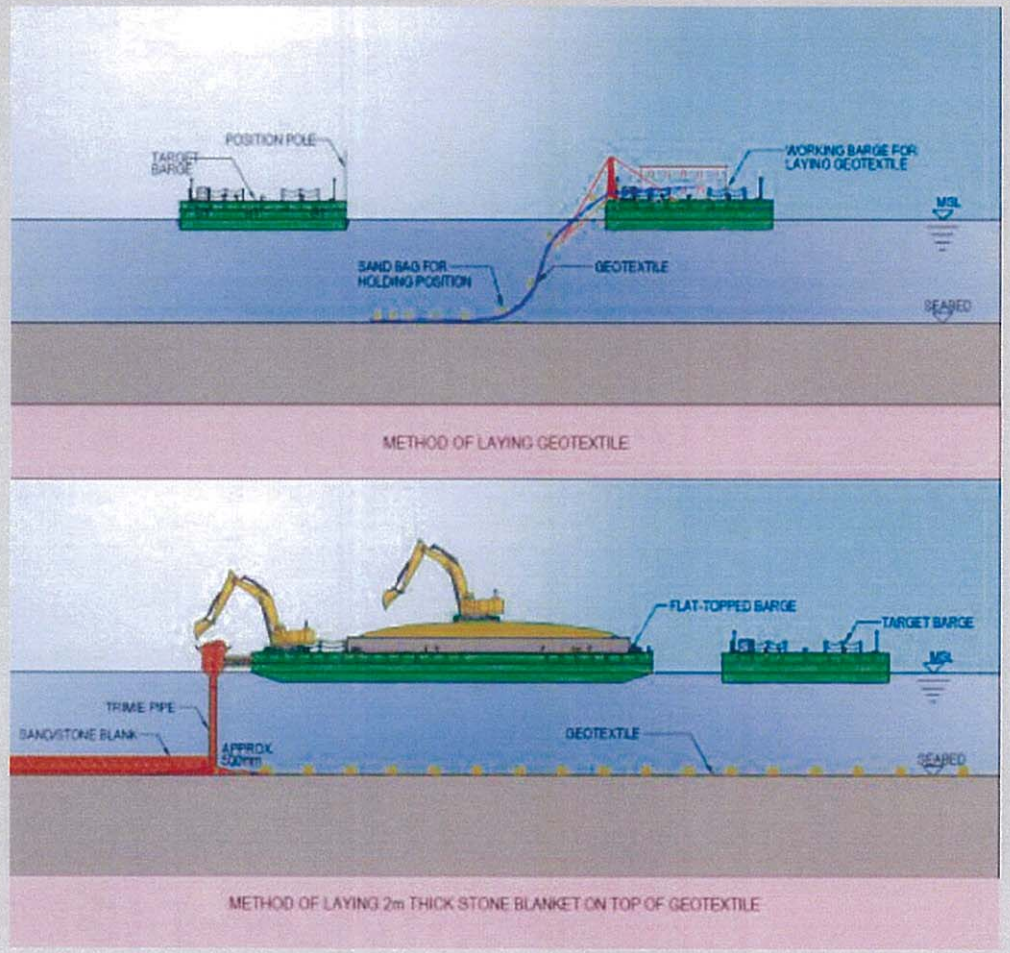
Tug Boat

LoA:	24 m
Beam:	7 m
Draught:	2.7 m
Air-draft:	16 m

Marine Operations: Geo-textile Laying

CPT & Geo-textile laying - Vessel Particulars

- Geo-textile will be laid over the seabed
- Followed by a tremie concrete on top of the Geo-textile



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Marine Operations: Vessel Particulars

Geo-textile Laying - Vessel Particulars

Specification:

Derrick Barge

LoA:	49 m
Beam:	21 m
Draught:	2.7 m
Air-draft:	31.6 m

Marine Operations: Vessel Particulars

Proposed Barges – *Pipe Installation*

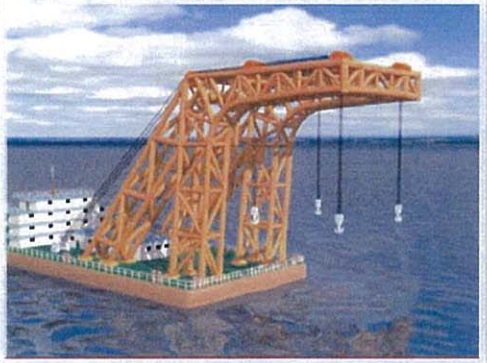
Specification:

Derrick Lighter

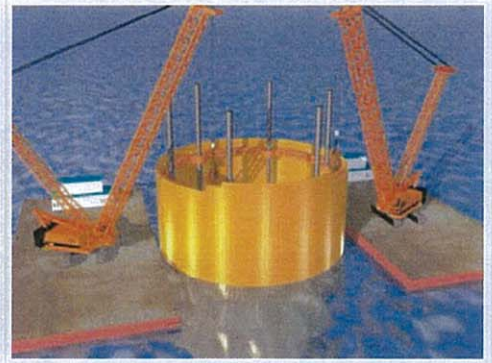
LoA:	49 m
Beam:	17 m
Draught:	5 m
Air-draft:	27.1 m

Marine Operation – Involved Vessel types

Craft involved include the following types and maximum numbers:



Special barges



Crane barges

Geotextile barges

Local tugs

Fill barges

Pelican vessels

Dredgers

Guard boat

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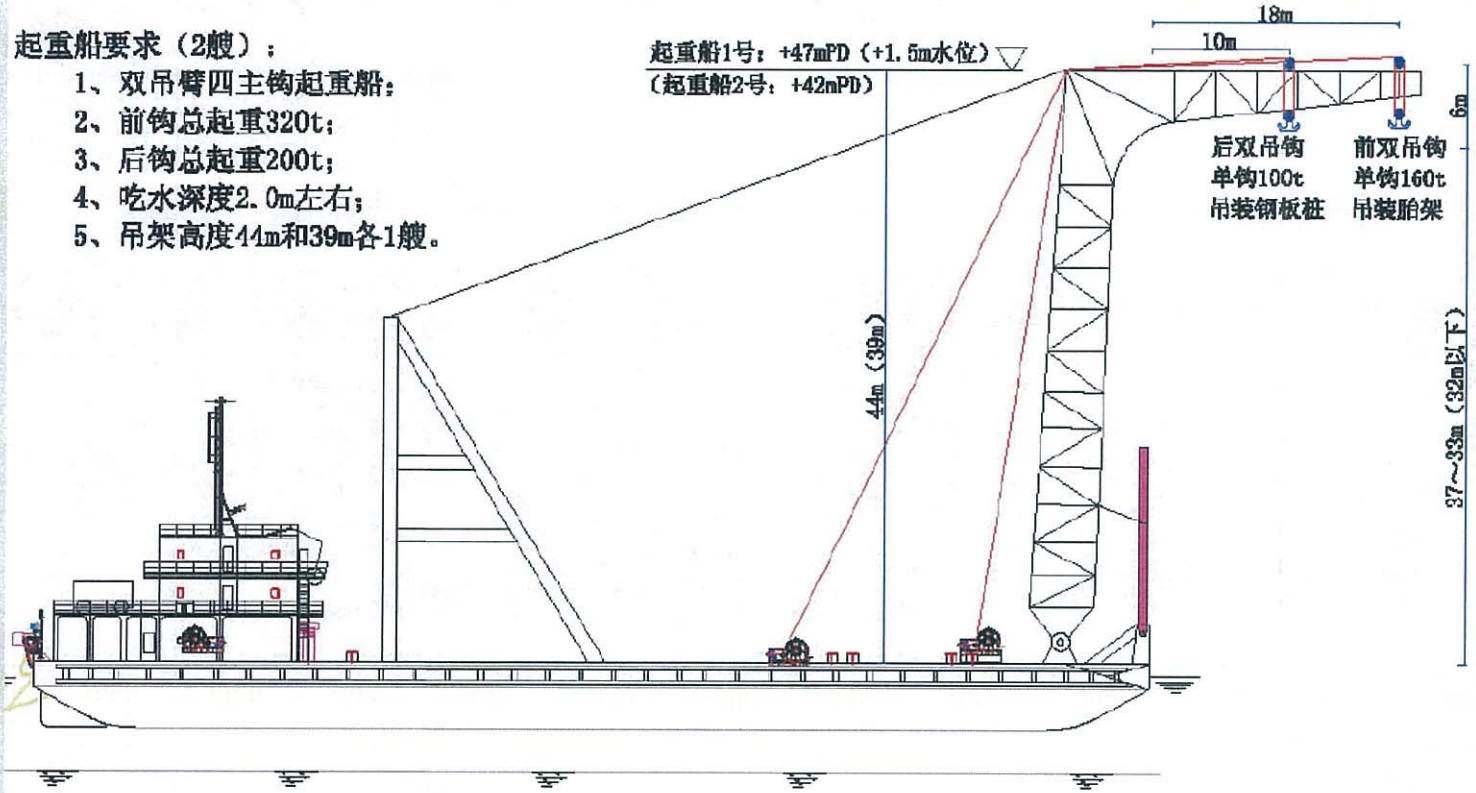
Special Barge 1: Cell Installation Barge

Vessel Particular for Cell Installation Barge

起重船要求（2艘）：
1、双吊臂四主钩起重船；
2、前钩总起重320t；
3、后钩总起重200t；
4、吃水深度2.0m左右；
5、吊架高度44m和39m各1艘。



2艘起重船：起重船1号，吊架高度44mm，施工水位+1.5mPD、干舷高度1.5m水位时，吊架最高点+47mPD。
起重船2号，吊架高度39mm，施工水位+1.5mPD、干舷高度1.5m水位时，吊架最高点+42mPD。

Two crane fleets are modified to suit the whole cell preassembling construction method

Fleet No. 1

Frame height at +47mPD

Fleet No. 2

Frame height at +42mPD

(assume water level at approximately +1.5mPD)

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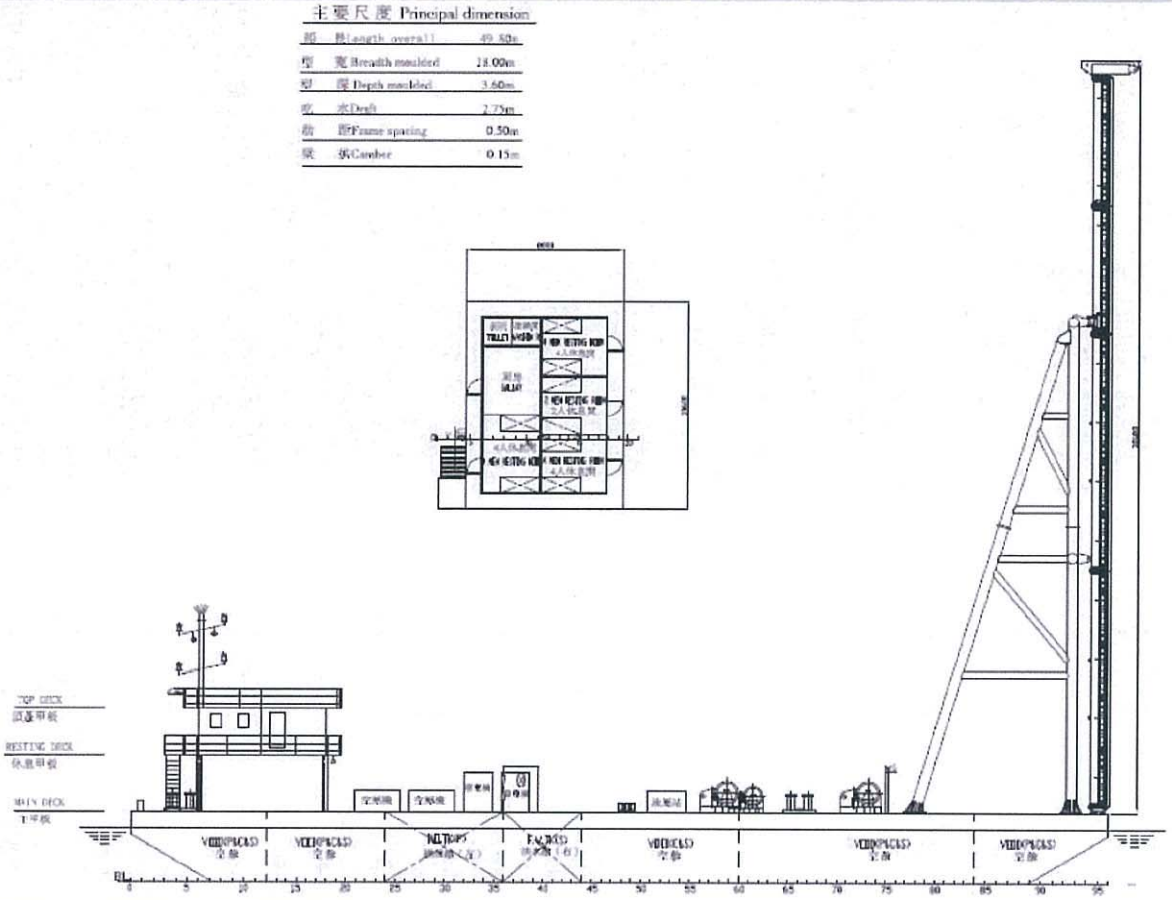
Special Barge: Stone Column Vessel

Vessel Particular for Cell Installation Barge



Vessel for > 42mPD

Overall Length=49.8m
Width = 18m
Depth = 3.6m
Draft = 2.75m
Height of Boom = 38m
No. of Vessel = 3Nos.

Vessel for > 23mPD

Overall Length=49.8m
Width = 18m
Depth = 3.6m
Draft = 2.75m
Height of Boom = 19.5m
No. of Vessel = 2Nos.
Available Change to 38m Boom

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Appendix B

Dolphin Friendly – To Do and Not To Do Checklist

Dolphin Friendly – TO DO and NOT TO DO CHECKLIST

TO DO

1) Always slow down to no-wake speed, and stop if dolphins appear directly ahead within 100m.

2) Keep vessel at a slow, steady speed without sudden course changes. Boat speed should not exceed 10 knots.

3) Never conduct reverse throttling when dolphins are nearby.

NOT TO DO

1) When observing dolphins near pair trawlers, the project related working fleets should not
   a) go near the marker buoy of the trawl net;
   b) move away suddenly after trawlers hauled up the net.

2) Do not litter or discharge any pollutants into the sea

3) Never touch, swim with, or feed dolphins

4) Never chase or intercept the course of dolphins, separate mothers and calves or 'corner' dolphins

5) Never approach dolphins head on