

Environmental Permit No. EP-388/2010

Development of a Bathing Beach at Lung Mei, Tai Po

Independent Environmental Checker Verification

Reference Document/Plan

Document/Plan to be Certified/ Verified:	Fauna Translocation Plan – Stage 2
Date of Report:	28 December 2017 (Version 3)
Date received by IEC:	28 December 2017

Reference EP Condition

Environmental Permit Condition: 3.11

To minimize the potential ecological impact on fish species of conservation importance including Two-spot Goby *Psammogobius biocellatus*, Tropical Sand Goby *Favonigobius reichei* and Grass Puffer *Takifugu niphobles*, the following precautionary measures shall be implemented:

- (a) The removal of rocks/hard objects in the intertidal zone shall be conducted during low tide and the area shall not exceed 10m² for each removal. The rock removal works shall be conducted under the supervision of a qualified fish specialist who will be responsible for checking for any species of concerns under the rocks/hard objects to be removed. The proposed fish specialist shall be agreed by the Director.
- (b) The “cleared” areas shall be properly fenced off immediately after removal of the rocks/hard objects. The qualified fish specialist shall inspect the areas beforehand to avoid trapping any species of concerns inside the enclosed area; and
- (c) A trial shall be conducted in the beginning of the rock removal work so as to further fine-tune the above method, if necessary.

IEC Verification

I hereby verify that the above referenced document/plan complies with the above referenced condition of EP-388/2010.

Mr Jovy Tam

Date: 28 December 2017

Independent Environmental Checker



Contract No. CV/2012/05

Fauna Translocation Plan - Stage 2

Dr. Mark Shea

(Version 3; 28 December, 2017)

1 Objective

- 1.1 To comply with the EP [EP No. EP-388/2010; Section 3.11 (c), under Part C, Permit Conditions], i.e., “A trial shall be conducted in the beginning of the rock removal work so as to further fine-tune the ‘fauna translocation method’ if necessary. Trials for rock removal were performed on 21st September and 4th October 2017.
- 1.2 To relocate the target fauna species as specified in EP and contract particular specification (PS). The main target species included 3 fish species specified in the EP, i.e., Two-spot Goby (*Psammogobius biocellatus*), Tropical Sand Goby (*Favonigobius reichei*), Grass Puffer (*Takifugu niphobles*), as well as starfish, sea urchins, sea cucumbers within the intertidal zone of the Site. Nine other fish species that are specified in the PS will also be included in the translocation exercise, including: Brown frillin goby (*Bathygobius fuscus*), Fork tongue goby (*Glossogobius giuris*), Estuarine goby (*Mugilogobius abei*), Barcheek goby (*Rhinogobius giurinus*), Shimofuri goby (*Tridentiger bifasciatus*), Saddle grunt (*Pomadasy maculatus*), Spotted scat (*Scatophagus argus*), Japanese sillago (*Sillago japonica*) and Jarbua terapon (*Terapon jarbua*); and to release the collected target species at the reception site of Ting Kok East Tai Po.

2 Scope of Fauna Translocation

- Setting up Fencing Structure
- Fauna Collection within Project Site at Lung Mei, Tai Po
- Fauna Releasing at Reception Site of Ting Kok East, Tai Po

3 Method

Setting up Fencing Structure

- 3.1 Objective of setting up fencing is to prevent the target fauna return to the cleared project section after performing fauna translocation. The fencing structure should tolerate tidal changes and hydraulic force. Major components of the fencing structure with its functions are listed below and shown in Photos 1 to 3 and Figure 1:
 - Weight (i.e. concrete blocks or steel cage with rocks): anchoring of silt curtain;
 - silt curtain: allowing water flow in and out and prevent animals get through;
 - metal chain: provision of weight for sinking bottom side of silt curtain to seabed;
 - buoy: provision of floating force for upper side of silt curtain;
 - ropes: anchoring buoy to gravity mass; and
 - red flashing lights and flags: for safety warning.

Rock Removal Trial

- 3.2 Two trials were conducted for rock removal and capturing marine fauna within the 10m² block on the 21st September and 4th October 2017. Representatives from EPD, AFCD and CEDD have presence in the trial on 4th October 2017.

Stages of Marine Fauna Translocation Exercise

- 3.3 There are altogether 4 Stages in the entire marine fauna translocation exercise as shown in Figure 2. Each stage of work includes the collection and release of the target marine faunas together with the associated works in setting up the silt curtain fencing system to enclose the translocation area. This document specifies the arrangement and methodology for the Stage 2 translocation works.

Set up Fencing System

- 3.4 The fauna translocation operation cycle and plant mobilization sequence are shown in Figures 3.1a to 3.1i and 3.2a to 3.2g respectively. The anchoring of silt curtains for fencing off the area will be achieved by deploying weight including concrete blocks and steel cages with rocks. For the deployment of concrete blocks, excavator with dimensions 4m (Long) × 2.5m (Wide) will be used. As a precautionary procedure, fish specialist will inspect the excavator travelling route prior to the movement and operation of the excavator. If marine fauna(s) is/are observed in the excavator route, target faunas will be collected in a container filled with seawater with air supply, and then released together with other target faunas collected during fauna collection. Other faunas will be moved out of the fenced area. For the deployment of steel cages with rocks, the cages will be moved to and positioned on the seabed manually, and rocks will be added into the cages as weights. Silt curtain will be set up to allow a wet zone at all tidal conditions to allow sufficient water inside the enclosed area of the silt curtain.

Fauna Collection

- 3.5 According to Environmental Permit (EP) Condition 3.11(c), a trial was conducted from 25 to 29 November 2017 so as to further fine-tune the method. Given that the translocation works are additional to the EP requirement, the areas to be cleared is fine-tuned to be fenced off before and during the removal of the rock/hard objects. The EP condition 3.11(b) “The ‘cleared’ areas shall be properly fenced off immediately after removal of the rocks/ hard objects” remains unchanged.
- 3.6 Fauna capture at the exposed upper tidal area will be performed in grids that are approximately 10m² each, marked by nylon string laid on the surface of the seabed. Search of target fauna will be undertaken systematically from the one side of the grid to the other side. Moveable rocks will be turned over to check animals under the rock and the checked rocks will be moved to nearby “cleared” area within the grid. When target faunas or other large animals are encountered, hand capture with assistance of hand net will be done and animals will be put to a small container with seawater and will be transferred to battery-powered air pumping fish container with sea water located on upper shore. Fauna capture and translocation process will be supervised by the qualified fish specialist (Dr. Mark Shea, refer to Appendix A: the approval letter issued by EPD). Translocation of captured marine faunas will be all in accordance to the approved fauna translocation plan. All fauna (including fish and echinoderm) will be captured by hand (capturing fauna on land) with the aid of net (capturing fauna in water).

- 3.7 When working in intertidal area, seawater clarity is a crucial factor in finding and capturing marine faunas inside seawater. Animal capture will be performed at grids that are approximately 10m² each. The grids will be temporally fenced off by setting up floating buoys fixed with nets. When moveable rocks are encountered, animals under rocks will be checked by turning over and removing rocks to nearby “cleared” area within the grid. The objective of this measure is to facilitate more precise inspection and checking by the fish specialist under a better controlled environment. The “cleared” area will then be fenced off afterwards.
- 3.8 During fauna translocation, only manual effort, instead of machinery, will be deployed in order to minimize disturbance.
- 3.9 Target fishes and echinoderms are the two main groups of target marine fauna for translocation. Searching and capturing of these species will be performed to find animals on the substrates as well as under the rocks/hard objects in the intertidal area. During the operation, rocks/hard objects will be lifted up manually to facilitate inspection and checking for any concerned species hiding under them. The non target fauna captured by nets during fauna translocation operation will also be released outside the fenced area. Capturing of fishes within the grids will be undertaken using hand nets. Captured fishes will be immediately transferred to fish containers (volume > 5 litres) filled with seawater from Lung Mei and oxygenated with portable air pumps after completed the grid. Fauna searching and capturing will be conducted during low tide.
- 3.10 Particular attention will be paid to the three fish species of conservation importance specified under the Environmental Permit Condition 3.11 (Permit No. EP-388/2010): Two-spot Goby (*Psammogobius biocellatus*), Tropical Sand Goby (*Favonigobius reichei*) and Grass Puffer (*Takifugu niphobles*).
- 3.11 Echinoderms including starfish, sea urchins and sea cucumbers will be captured by hand. Starfish, sea cucumbers and urchins will be put to hand-carry small barrel with seawater first, and will be transferred to larger plastic / polystyrene containers / (volume > 10 litres) with a shallow layer (> 4 cm) of seawater to retain moisture for oxygen exchange until translocation. The plastic / polystyrene containers will be filled with seawater oxygenated with portable air pumps (aerated water tanks). Seawater collected from Lung Mei will be used for holding the captured marine fauna.
- 3.12 Records of the captured organisms will be kept using the template form in **Appendix B**.
- 3.13 A grid will be considered as “cleared” upon completion of the inspection, checking and capturing of target marine fauna and final checking by the qualified fish specialist to confirm no trapping of target species in the area. The grid will then be fenced off by temporal floating buoys with fish nets. All “cleared” grids will be fenced off by silt curtain with concrete blocks / steel cages with rocks at the end of each capturing day to prevent re-entering of fauna.
- 3.14 The conditions of the captured target marine fauna will be checked at 30-minute intervals or less. Water level check in fish containers will be conducted every hour or at any interval deemed necessary by the qualified fish specialist. The captured fishes and echinoderms will be transported to Ting Kok East within four hours after captured. Transportation and release of the captured creatures shall be performed as quick as possible in order to minimize the transportation and release time of the organisms.

Fauna Releasing at Reception Site of Ting Kok East

- 3.15 The captured target marine fauna from the Project Site will be transported to the Reception Site at Ting Kok East (Figure 4) during the same day of capturing by land transportation or by marine vessel. Care will be taken during the whole process to ensure no harm to the captured species.
- 3.16 The captured target marine fauna will be kept separately in three different substratum type containers (Type A, Type B and Type C) based on the seabed substratum types where they were captured. There will be three types of the seabed substratum: Type A, sand; Type B, soft bottom with scattered rubbles; Type C, boulders and rubbles with soft bottom. At the reception site at Ting Kok East, the captured organisms will be released to habitats and elevations that are similar to the environment where capturing was conducted (Figures 5a & 5b). The relevant habitat types will be pre-marked at the reception site and red flags will be set up for locating these habitats for the release of the captured organisms. Photo records of the capturing habitats and releasing habitats will be taken.
- 3.17 Proper records for the translocation works will be kept (the template in **Appendix B**) and duly completed by the qualified fish specialist daily. Details such as capturing time, location, approximate size, species, survival percentage, releasing time of the captured individuals etc., will be included. Any dead creatures found during the translocation exercise will be recorded in the log book.
- 3.18 Works could be commenced on any cleared zone. Translocation records will be provided by the fish specialist and verified by the IEC before it can be declared that the zone is cleared.
- 3.19 Plant and workers will be used in the entire marine faunas translocation exercise include:
- a. Concrete blocks positioning and setting up
 - One excavator
 - One fish specialist
 - One to two labourers
 - b. Silt curtain transportation and hanging
 - One excavator
 - One fish specialist
 - One to two labourers
 - c. Rock removal
 - One fish specialist
 - Two to four workers
 - d. Fauna capture
 - 3 fish container(s) with portable air pump (aerated water tanks) and sea water
 - Hand nets, spates, bamboo poles, nylon nets
 - One fish specialist as supervisor
 - 3 to 5 ecologist/assistant ecologist/ecology technicians/workers
 - e. Fauna transportation from Lung Mei to reception site at Ting Kok East
 - One vehicle
 - One fish specialist
 - One worker

4 Fauna Translocation Programme

- 4.1 The stage 2 of marine fauna translocation includes the installation of concrete at external boundary and translocation for eight zones with one-day cycle per zone. The working days will be completed in January 2018. The actual translocation schedule shall be recorded in the monthly EM&A report.

5 Seahorses Found During Fauna Translocation and Seahorse Translocation

- 5.1 If seahorse(s) is/are found inside fauna translocation area, fish specialist will inform seahorse translocation team marine ecologist to come and undertake seahorse translocation as stated in seahorses translocation method statement.

Photo 1. Close-up of the fencing structure with concrete blocks and silt curtain



Photo 2. Demonstration of the fencing structure with concrete blocks and silt curtain on land

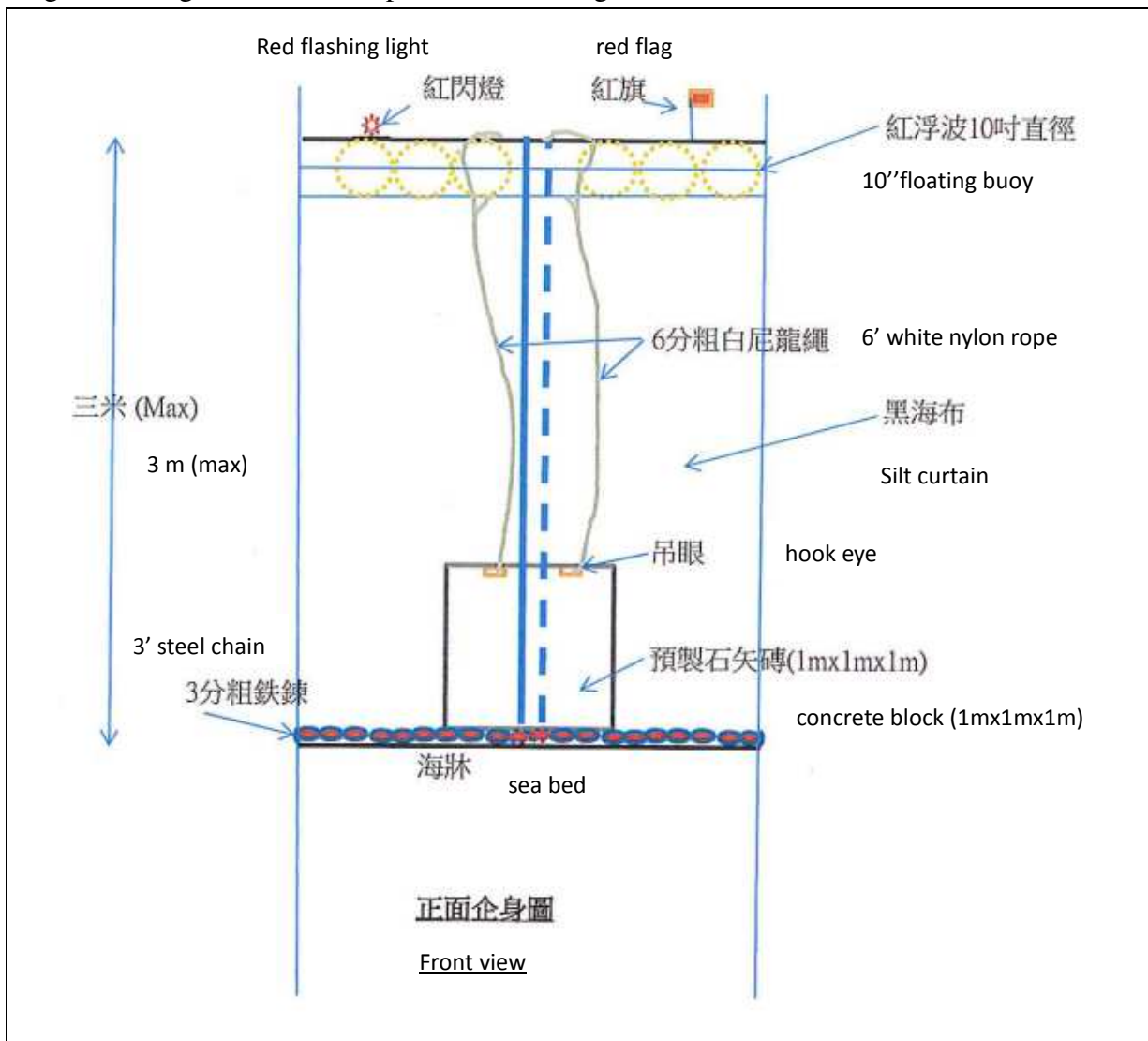


Photo 3. Demonstration of the fencing structure with concrete blocks and silt curtain in water



Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2

Figure 1: Diagram shown components of fencing structure.



Bathing Beach at Lung Mei Fauna Translocation Plan - Stage 2

Figure 2: Diagram shown stages of fauna translocation at Lung Mei, Tai Po.

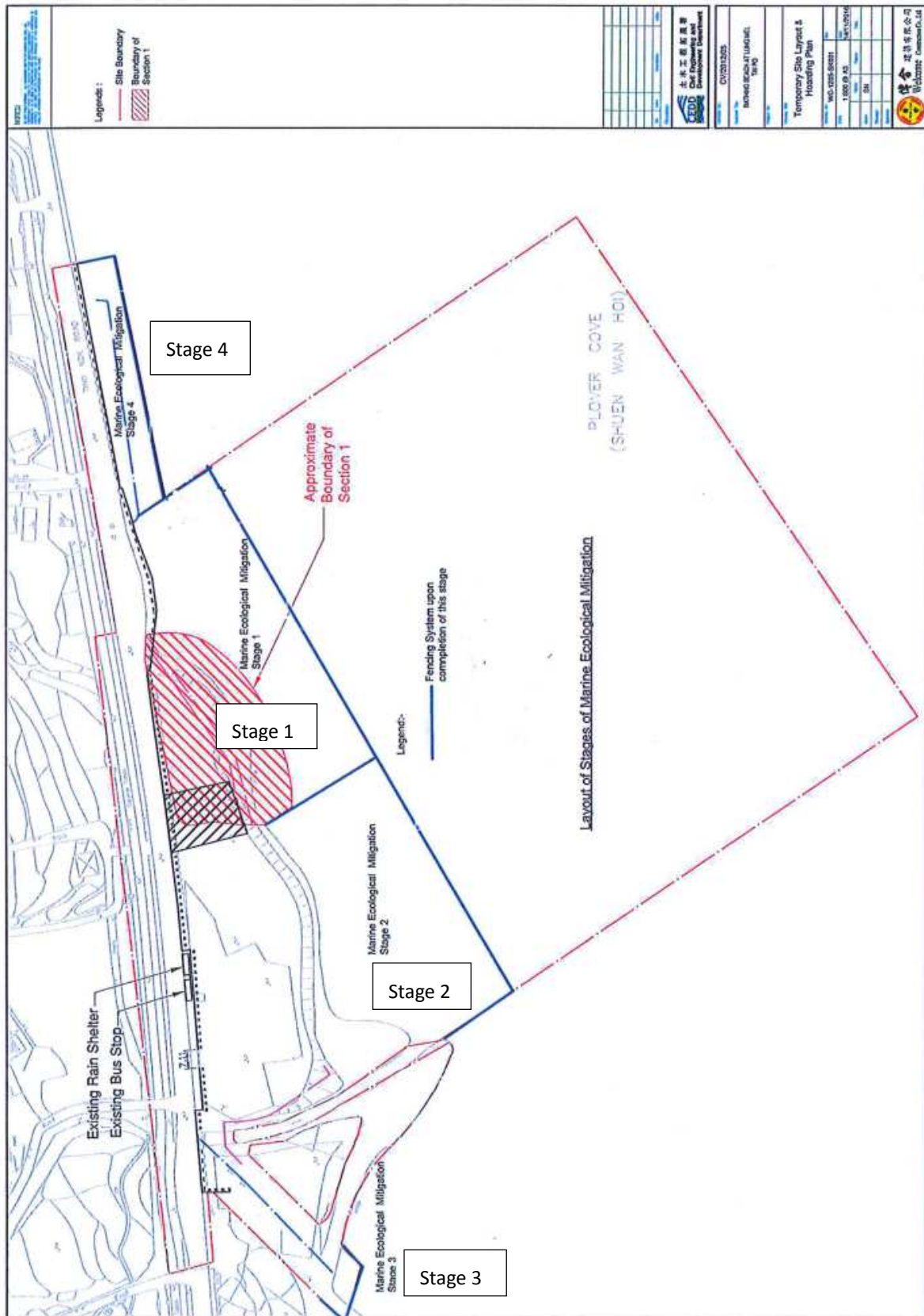
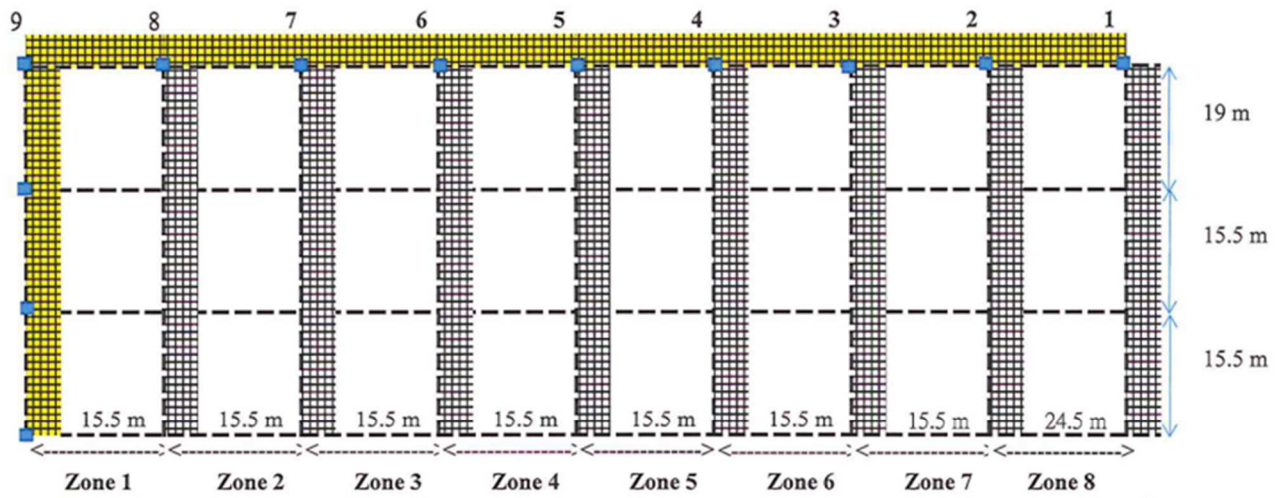


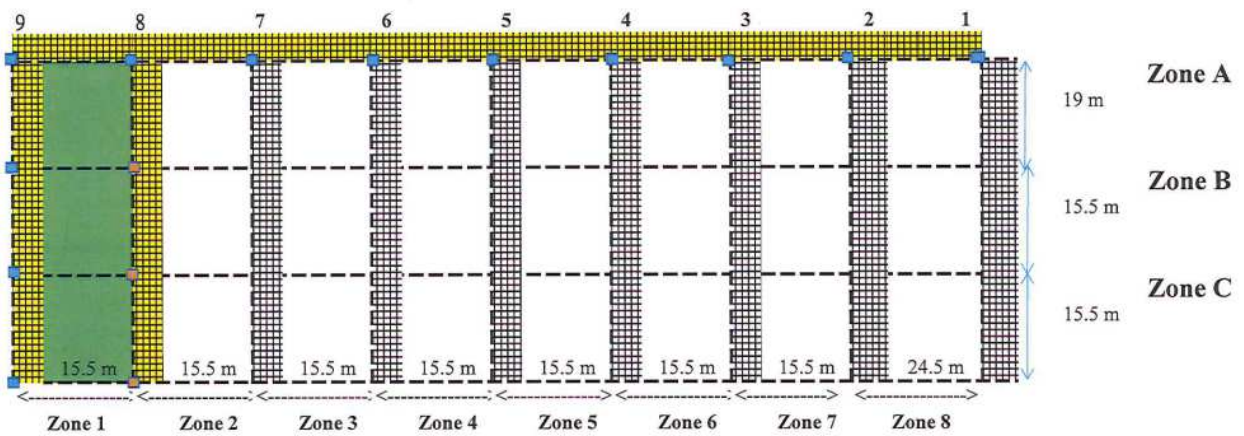
Figure 3.1 a - h: Fauna Translocation Operation Cycle

Figure 3.1a



Fauna Translocation Sequence No.1
Install concrete blocks (blue squares) and silt curtain along the cleared path

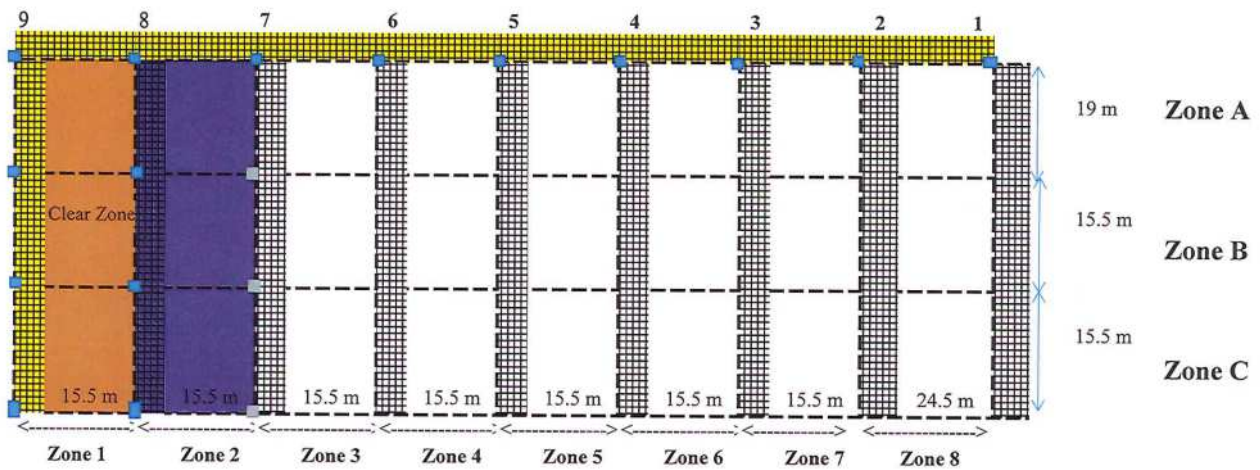
Figure 3.1b



Fauna Translocation Sequence No.2
Install concrete blocks (orange squares) and silt curtain before zone 1 translocation

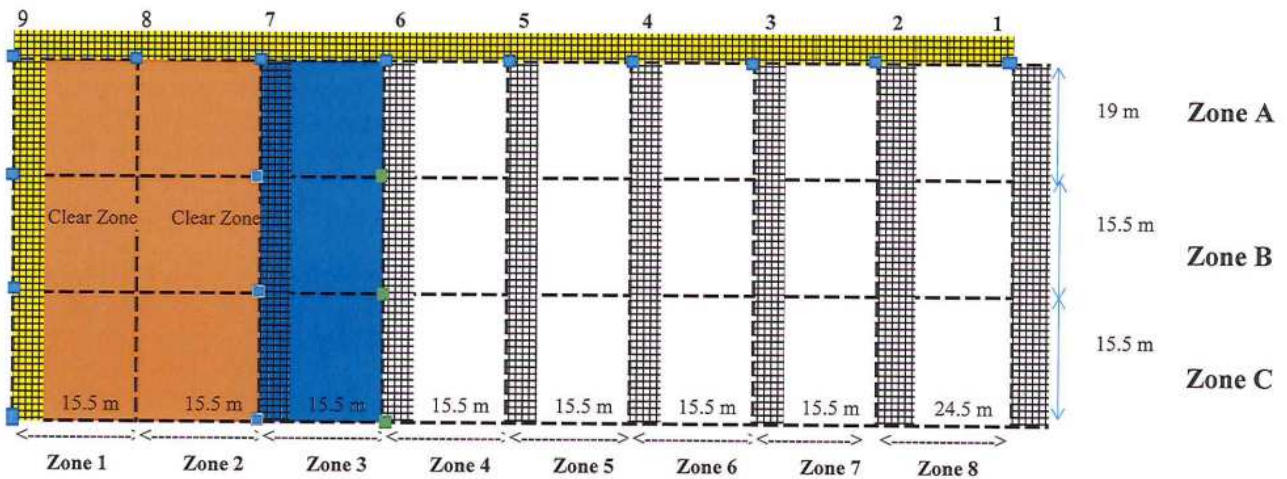
Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2

Figure 3.1c



Fauna Translocation Sequence No.3
 Install concrete blocks (grey squares) and silt curtain before zone 2 translocation

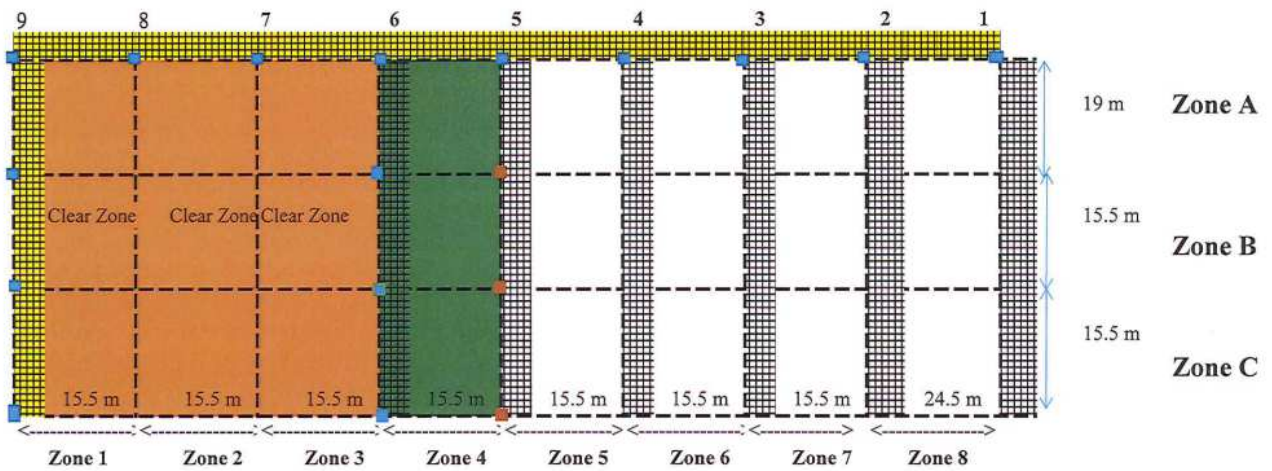
Figure 3.1d



Fauna Translocation Sequence No.4
 Install concrete blocks (green squares) and silt curtain before zone 3 translocation

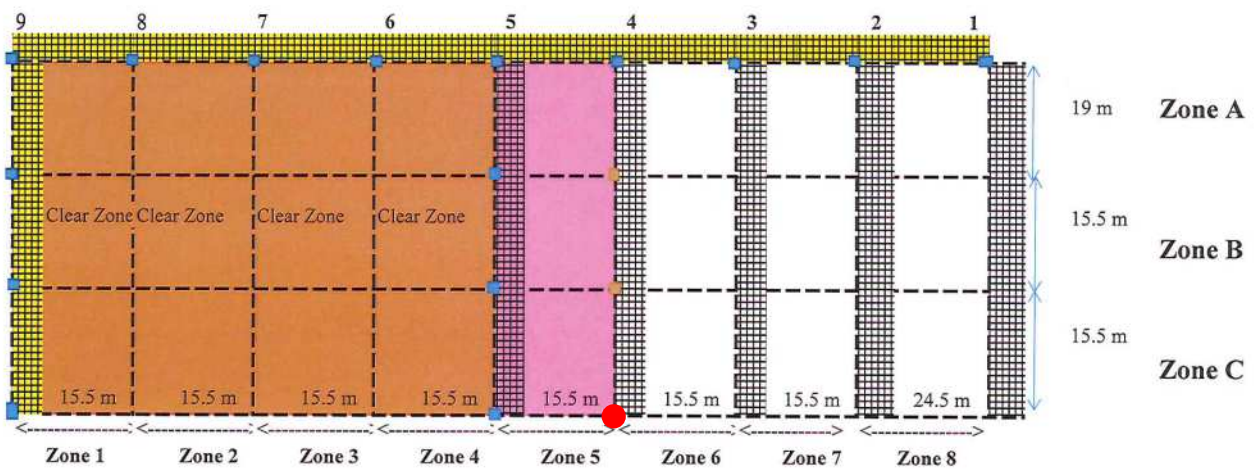
Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2

Figure 3.1e



Fauna Translocation Sequence No.5
 Install concrete blocks (orange square) and silt curtain before zone 4 translocation

Figure 3.1f



Fauna Translocation Sequence No.6
 Install concrete blocks (orange squares), steel cage with rock (red circle) and silt curtain before zone 5 translocation

Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2

Figure 3.1g

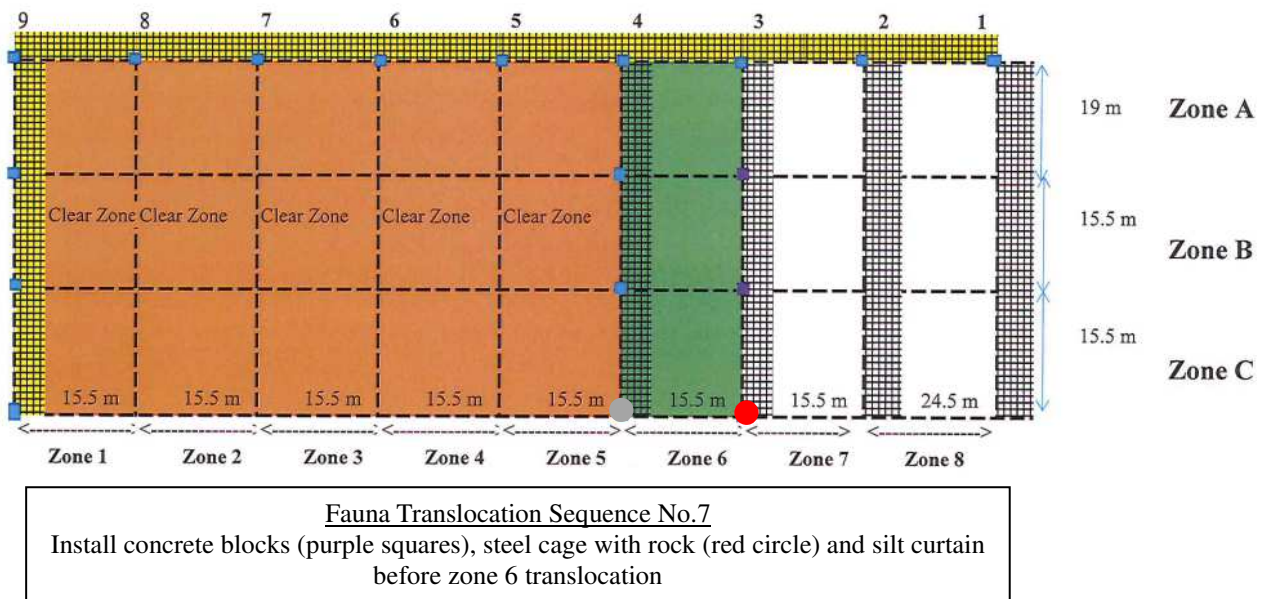
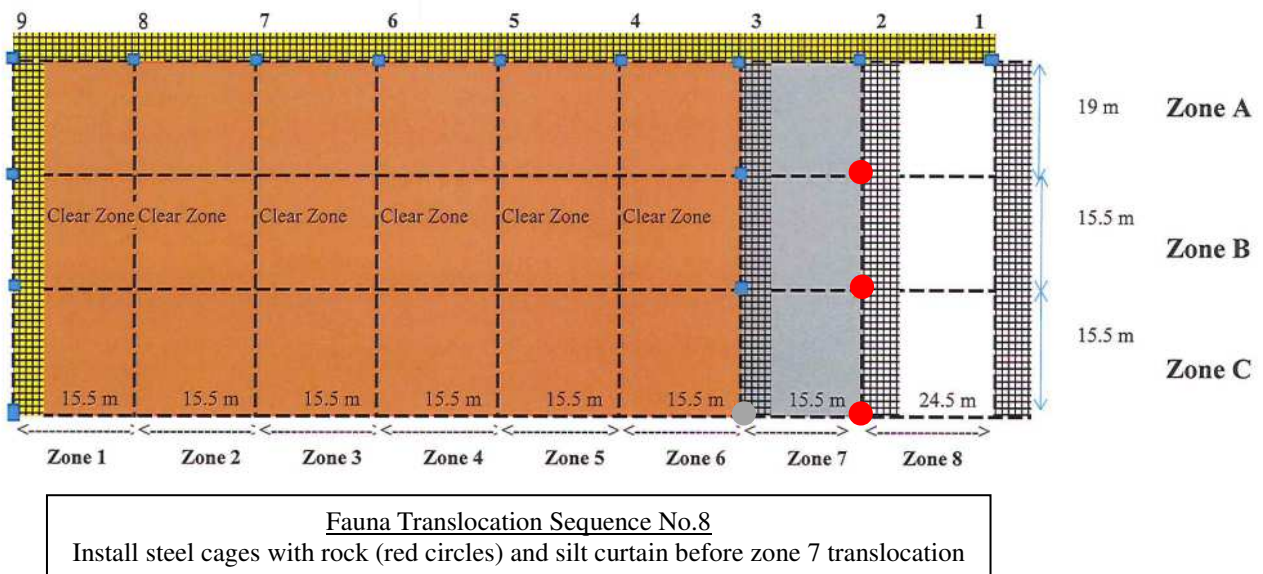
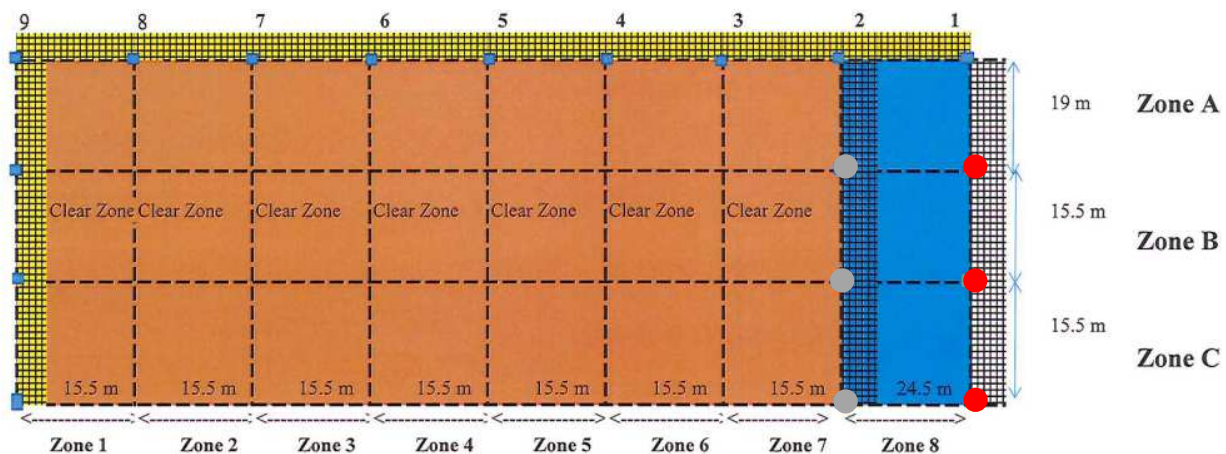


Figure 3.1h



Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2

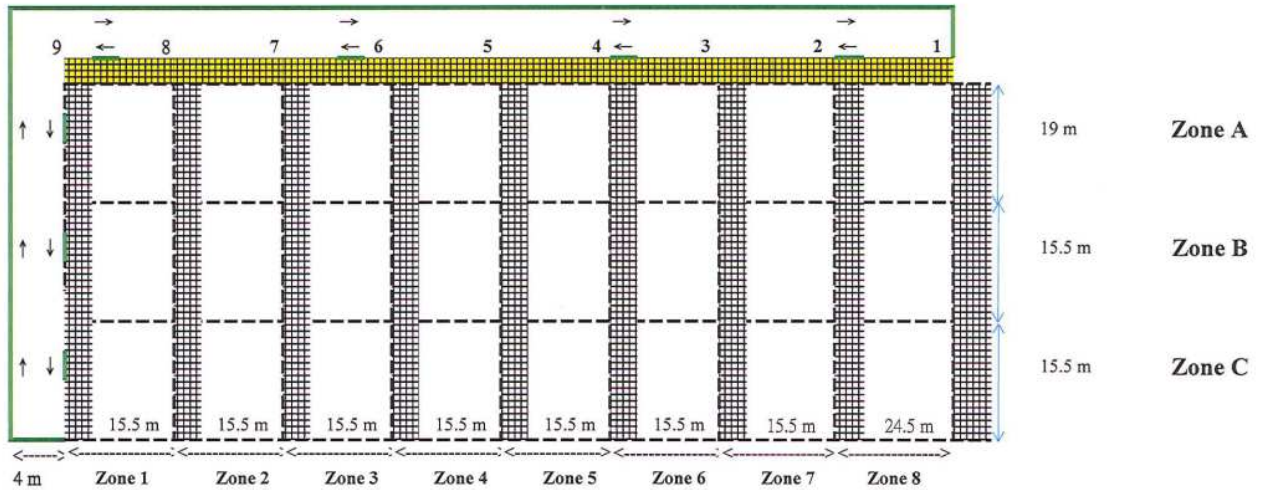
Figure 3.1i



Fauna Translocation Sequence No.9
Install steel cages with rock (red circles) and silt curtain before zone 8 translocation

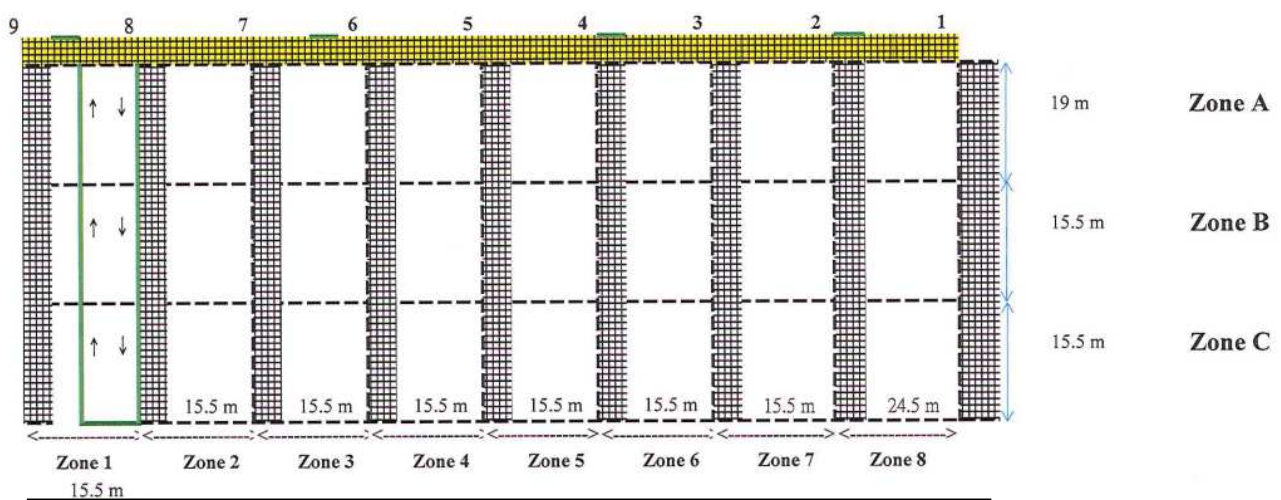
Figure 3.2 a - g: Plant Mobilization Sequence
(arrow indicates the plant mobilization direction)

Figure 3.2a



Plant Mobilization Sequence No.1
Install concrete block and silt curtain along the cleared path before translocation at stage 2

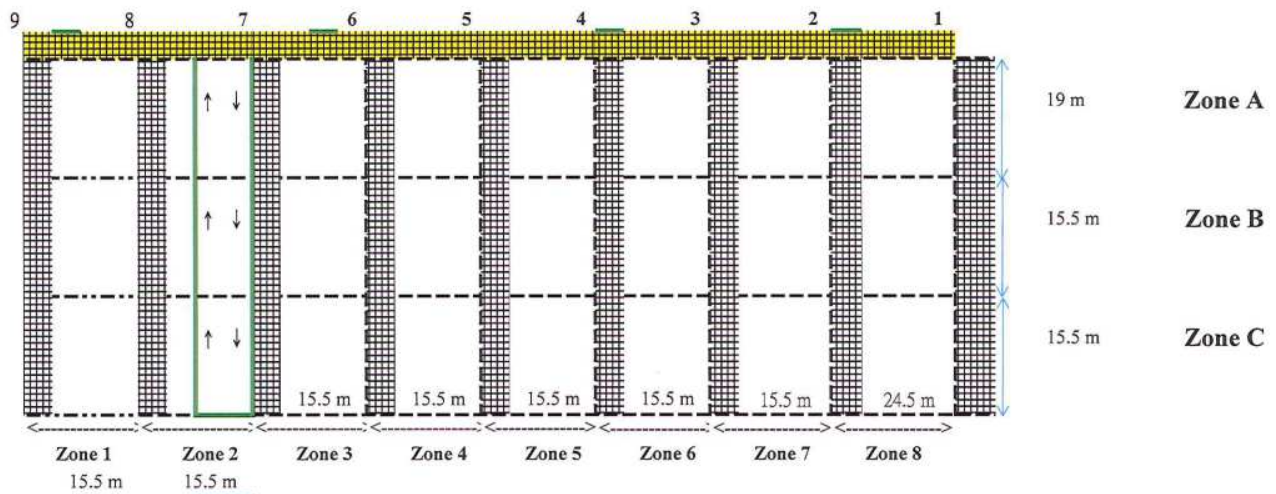
Figure 3.2b



Plant Mobilization Sequence No.2
Install concrete block and silt curtain along the path enclosed in green before zone 1 translocation

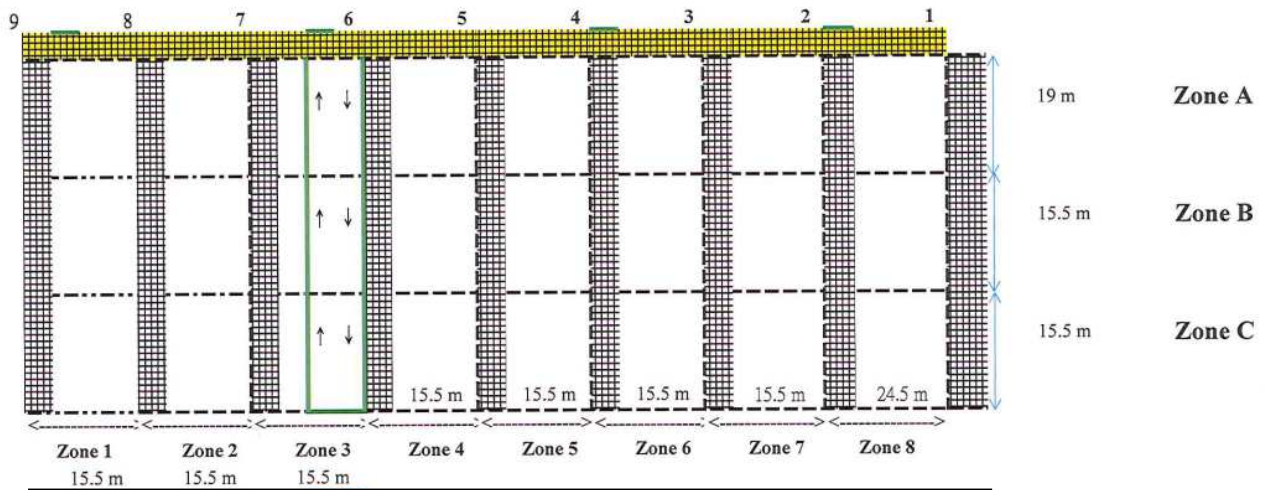
Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2

Figure 3.2c



Plant Mobilization Sequence No.3
 Install concrete block and silt curtain along the path enclosed in green before zone 2 translocation

Figure 3.2d



Plant Mobilization Sequence No.4
 Install concrete block and silt curtain along the path enclosed in green before zone 3 translocation

Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2

Figure 3.2e

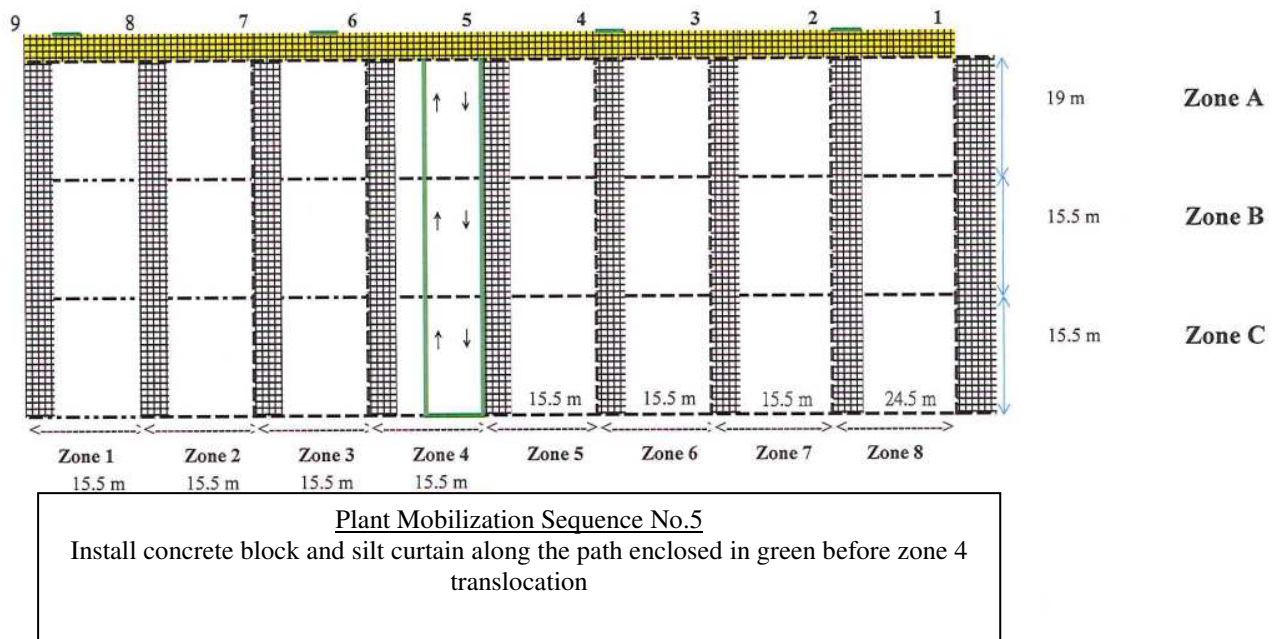


Figure 3.2f

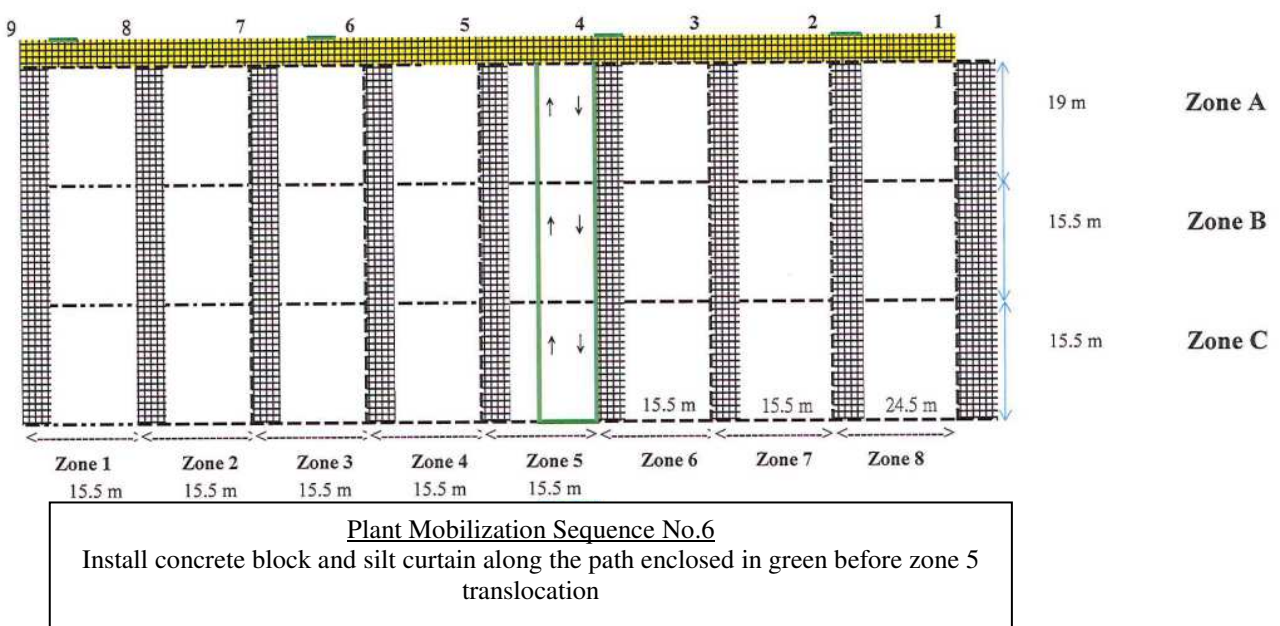


Figure 3.2g

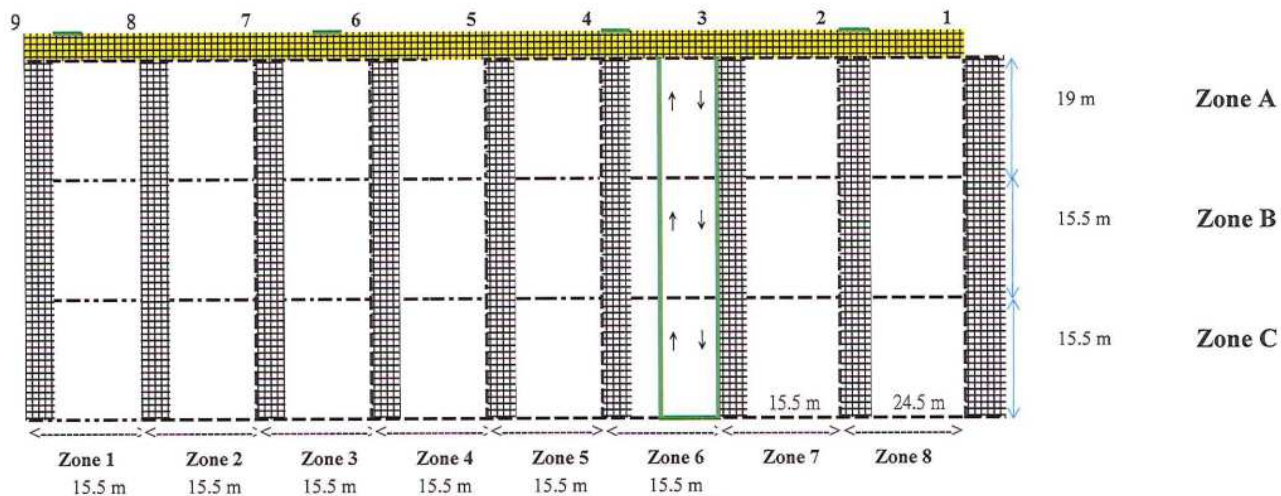


Figure 4: Proposed reception area for fauna translocation at Ting Kok East, Tai Po.



Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2

Figure 5a: Habitat map showing different substratum type at Lung Mei, Tai Po.



**Bathing Beach at Lung Mei
Fauna Translocation Plan - Stage 2**

Figure 5b: Habitat map showing different substratum types at Ting Kok East, Tai Po.



Appendix A: The approval letter for fish specialist issued by EPD

本署標誌
OUR REF: (32) in EP2/N5/C/46 PL5
來函編號
YOUR REF:
電話
TEL. NO.: 2835 1335
傳真號碼
FAX NO.: 2591 0558
電子郵件
E-MAIL:
網址
HOMEPAGE: <http://www.epd.gov.hk>

Environmental Protection Department
Branch Office
28th Floor, Southern Centre,
130 Hennessy Road,
Wan Chai, Hong Kong.

環境保護署分處
香港灣仔
軒尼詩道
一百三十號
德輔中心廿八樓



By Registered Post & By Fax 2714 2054
Civil Engineering and Development Department
101 Princess Margaret Road,
Kowloon, Hong Kong
(Attn: Mr. C Y Wong)

26 April 2017

Dear Mr. Wong,

Environmental Impact Assessment (EIA) Ordinance, Cap.499
Project title: Development of a Bathing Beach at Lung Mei, Tai Po
(Environmental Permit No. EP-388/2010)

Proposed Qualified Fish Specialist and Specialist for Mangrove Seedling Planting
EP Conditions 3.11(a) & 3.12(a)

I refer to the letter from your Mr. C.F. Chan dated 15.2.2017 as cover of your memo on 19.1.2017 which enclosed the curriculum vitae of Mr. Shea she-sang, Mark.

We note the professional qualifications and experiences of Dr. Shea and we agree Dr. Shea to be the:-

- (i) Qualified fish specialist in accordance with Condition 3.11(a) of the EP; and
- (ii) Qualified specialist to supervise the mangrove seedling planting works in accordance with Condition 3.12(a) of the EP.

The above nomination under EP Conditions 3.11(a) & 3.12(a) will be kept on the EIAO Register for public inspection as per EIAO section 15 and EP Condition 1.10. You are reminded to follow up on the remaining submission (i.e. Mangrove Seedling Planting Proposal) required under Condition and 3.12 (b) to (c) of the EP

Yours sincerely,

CE	ER/D	SE/M1	SE/M2	SE/P1	SE/P2	SE/P3	SE/P4	SE/P5	SE/SD	E/	PC/	
B.U.		C.C		Cire to								

(Ms. Holy To)

Assistant Environmental Protection Officer
for Director of Environmental Protection

Internal
S(SA)6, S(RN)1

C.C.
AFCD/ Mr. K.T. WO

Fax: 2377 4427

EDMS No. _____

Appendix B: Template Record Sheet of Fauna Translocation

Date:

Weather Conditions:

Container No:

Site	Weather Condition	Temperature	DO (mg/L)	Turbidity (NTU)	Salinity (0/00)	pH
Project Site						
Reception Site						

Capture Time :

I. Detail of Captured Individuals in Container

Captured Location (Plot No., Shore Height and Associated Substrates) Eg, Sandy/ Sandy with Stones/Boulders	Captured Species	Number of Captured Individuals	Approximate Size (in size class of 5 cm range, eg, <5cm, 5 to 10 cm)
Plot No.1 1.0 mCD Boulders	Two- spot Goby	2	<5cm

II. Detail of Holding Conditions of The Captured Individuals

Time Departed from Project Site	Timing of Checking Individuals	Survival % during Time of Checking	Species and No, of Dead Individual Recorded	Partial Water Change Conducted (for Fish Fauna)	Arrival Time at the Reception Site
eg	10:30 am	100%			
eg 11:00 am		100%			
eg	11:30 am	100%		Y	

III. Detail of Captured Individual just before Release to the Reception Site

Arrival Time at Reception Site	Timing of Checking of Individuals	Survival % during Time of Checking	Species and No. of Dead Individual Recorded	Partial Water Change Conducted	Released Location (Shore Height and Associated Substrates)	Released Time and Survival % just before release to the Reception Site
Eg 12:45 pm		100%				
	13:00pm	100%		Y		
	13:30pm	100%				
					1.0mCD Boulders	13:45pm, 100%