



AUES

Lamma Island Cable System

Pre-Installation Coral Survey Report

Oct 2022

Our Ref: TCS01273/22/300/L0007

Hong Kong Telecommunications HKT) Limited
8/F, Lai Chi Kok Engineering Centre II
4 Yuet Lun Street
Lai Chi Kok
Kowloon

Attn: Mr. Cliff Ko

28 October 2022
By email only

Dear Sir,

Re: Lamma Island Cable System
Environmental Permit No. EP-609/2022
Certification of Pre-Installation Coral Survey Report

With reference to the Pre-Installation Coral Survey Report for Lamma Island Cable System, we herewith certify the report has conformed to the requirement as set out under Conditions 3.2 and 3.3 of the captioned Environmental Permit.

Should you have any queries, please feel free to contact the undersigned at Tel: 2959-6059 or Fax: 2959-6079 or Email: twtam@fordbusiness.com.

Yours sincerely,
For and on Behalf of
Action-United Environmental Services & Consulting (AUES)



Tam Tak Wing
Environmental Team Leader

cc SMEC

Ms. Cindy CHUNG

by e-mail



Member of the Surbana Jurong Group

local people
global experience

Our Ref: 7076911/L29172/AB/TSC/PL/rw

27 October 2022

Hong Kong Telecommunications (HKT) Limited
8/F, Lai Chi Kok Engineering Centre II
4 Yuet Lun Street
Lai Chi Kok
Kowloon
Hong Kong

By Email Only
(cliff.mk.ko@pccw.com)

Attention: Mr. Cliff KO

Dear Sir

**Lamma Island Cable System
Verification of Pre-Installation Coral Survey Report**

Reference is made to the *Pre-Installation Coral Survey Report* dated 27 October 2022, submitted by the Environmental Team via e-mail on 27 October 2022.

We hereby verify the said Pre-Installation Coral Survey Report has complied with the requirement as set out under Condition 3.3 of the Environmental Permit.

Thank you very much for your kind attention. Please do not hesitate to contact the undersigned should you have any queries.

Yours faithfully

Cindy CHUNG
Independent Environmental Checker

cc: AUES Ms. Nicola HON

(By Email: nicolahon@fordbusiness.com)

SMEC ASIA LIMITED
27/F Ford Glory Plaza, 37-39 Wing Hong Street
Cheung Sha Wan, Kowloon, Hong Kong
T +852 3995 8100
F +852 3995 8101
E hongkong@smec.com
W www.smec.com



Summary

- The Pre-installation Spot Dive Survey was carried out at the shore of Telegraph Bay (TB) and Pak Kok Tsui (PKT) on 20th and 21st October 2022.
 - A total of 86 coral colonies of gorgonian coral *Echinomuricea sp.*, (33 in TB and 53 in PKT) were recorded during the spot dive survey. All coral colonies during the survey are in good health condition and located within 3 m of the cable alignment.
 - All coral colonies recorded in the survey area are common species in Hong Kong water.
 - Some recorded coral colonies are located very close to the cable alignment in both TB and PKT, and a number of *Echinomuricea sp.* individuals may be disturbed when the cable is laid. However, the Project Profile revealed that the cable installation for the shore-end cable at landing sites of TB and PKT will be undertaken using a diver operated hand-held jetting tool. Direct impacts on the coral communities will be avoided by small adjustments to the cable alignment during manual installation. A number of *Echinomuricea sp.* individuals may be disturbed when the cable is laid but afterwards, when the seabed has reformed, *Echinomuricea sp.* will recolonise their former locations and the percentage cover will return to pre-installation levels.
 - A post-installation survey will be conducted to verify the health condition of the recorded nearby coral colonies after the cable laying work.
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1. Introduction

- 1.1 In support of the Government's policy initiative, the Office of the Communications Authority (“OFCA”) has implemented the “Subsidy Scheme to Extension Fibre-based Networks to Villages in Remote Areas” (“the Scheme”). The Scheme comprises six projects and Hong Kong Telecommunications (HKT) Limited (“HKT”) has been awarded “Project 6”, which includes the Lamma Island Cable System (“the Project”). The Project will provide a submarine fibre-optic telecommunications cable from Telegraph Bay (“TB”) at southwestern Hong Kong Island to Pak Kok Tsui (“PKT”) on the eastern side of the northern tip of Lamma Island.
- 1.2 The Project includes the offshore and shore-end sections of a cable, approx. 2.3km in length with a diameter of 60mm buried below the seabed that lands at TB on Hong Kong Island and at PKT on Lamma Island. Installation is scheduled to be completed in the fourth quarter of 2022 and the Cable System is planned to be in service by the fourth quarter of 2022.
- 1.3 Coral colonies were recorded in the near shore area of TB and PKT, which may be affected by the installation works. Given the proximity between the proposed cable alignment and recorded coral colonies in the vicinity of the cable landing at TB and PKT, as a precautionary measure a Pre-installation Coral Survey and a Post-project Coral Survey shall be carried out.
- 1.4 The Pre-installation Coral Survey aims to identify the locations of any corals in the near shore area of TB and PKT that are in proximity to the proposed cable alignment and to identify a cable alignment that avoid direct impact to the coral colonies as far as possible. This report presents the findings of the Pre-installation Coral Survey conducted in the near shore area of TB and PKT.

2. Methodology

- 2.1 One subtidal spot dive survey will be carried out in the near shore area of TB and PKT in proximity to the proposed cable alignment (Figure 1 and Figure 2) prior to the installation of the proposed cable. For each coral colony found, the following data should be recorded:
- GPS location
 - Species identification to genus or species level, as far as practicable
 - sizes (e.g. maximum diameter) and health of identified corals (e.g. degree of sedimentation, partial mortality, sign of bleaching)
 - Photographic record
 - Survey date and time
 - Underwater visibility
 - Atmospheric, sea and tidal conditions

3. Result

- 3.1 The Pre-installation Coral Survey was carried out on 20th and 21st October 2022 and the weather conditions were summarized in **Table 1**.

Table 1 Weather Condition for the spot dive survey on 20th and 21st October 2022

Date	Condition	Average Underwater Visibility
20 th October 2022	<ul style="list-style-type: none"> - East force 5, force 6 offshore at first, occasionally force 8 on high ground - Sunny interval - Tidal level 2.24m 	0 to 10 cm
21 st October 2022	<ul style="list-style-type: none"> - East to northeast force 5 to 6 - Sunny period - Tidal level 2.24m 	0 to 10 cm

Telegraph Bay

3.2 Spot dive survey was carried out from 09:30 to 15:30 on 20th October 2022 in TB (Figure 1). The water depth during the dive survey was 2 m to 15 m.

3.3 The survey area is mainly composed of sandy bottom with scattered boulders and rocks along the shore area of TB. Because of the strong winter monsoon, the sea condition was so rough and the average visibility along the survey area was less than 10 cm or zero during the dive survey.

3.4 No hard coral was recorded in TB and 33 gorgonian coral were recorded during the spot check survey. All of them are *Echinomuricea sp.* which located within 3 m of the cable alignment. Their GPS coordinates, size and health condition were recorded in **Table 2**. Since the water visibility was nearly zero in most of the time especially water depth more than 6 m, representative photos of corals only taken near the shore and they are shown in Photo Plate A. All the coral colonies recorded in the survey area are common species in Hong Kong water.

Table 2 GPS Coordinates, Size and Health Condition of Recorded Coral Colonies in TB during Spot Dive Survey

No.	Coral species	Size (cm)	% Bleaching	Partial Mortality	% Sediment	GPS Coordinates	
1	<i>Echinomuricea sp.</i>	15	0	0	0	22°15'18.39N	114°07'53.86E
2	<i>Echinomuricea sp.</i>	8	0	0	0	22°15'18.38N	114°07'53.90E
3	<i>Echinomuricea sp.</i>	121	0	0	0	22°15'18.38N	114°07'53.87E
4	<i>Echinomuricea sp.</i>	23	0	0	0	22°15'18.38N	114°07'53.87E
5	<i>Echinomuricea sp.</i>	24	0	0	0	22°15'18.39N	114°07'53.81E
6	<i>Echinomuricea sp.</i>	35	0	0	0	22°15'18.35N	114°07'53.78E
7	<i>Echinomuricea sp.</i>	15	0	0	0	22°15'18.31N	114°07'53.69E
8	<i>Echinomuricea sp.</i>	11	0	0	0	22°15'18.21N	114°07'53.61E
9	<i>Echinomuricea sp.</i>	16	0	0	0	22°15'18.17N	114°07'53.45E
10	<i>Echinomuricea sp.</i>	14	0	0	0	22°15'18.12N	114°07'53.36E
11	<i>Echinomuricea sp.</i>	6	0	0	0	22°15'18.18N	114°07'53.38E
12	<i>Echinomuricea sp.</i>	12	0	0	0	22°15'18.14N	114°07'53.31E
13	<i>Echinomuricea sp.</i>	17	0	0	0	22°15'18.11N	114°07'53.26E
14	<i>Echinomuricea sp.</i>	24	0	0	0	22°15'18.09N	114°07'53.21E
15	<i>Echinomuricea sp.</i>	25	0	0	0	22°15'18.07N	114°07'53.14E
16	<i>Echinomuricea sp.</i>	14	0	0	0	22°15'18.03N	114°07'53.11E
17	<i>Echinomuricea sp.</i>	16	0	0	0	22°15'17.99N	114°07'53.04E

No.	Coral species	Size (cm)	% Bleaching	Partial Mortality	% Sediment	GPS Coordinates	
18	<i>Echinomuricea sp.</i>	19	0	0	0	22°15'17.92N	114°07'52.99E
19	<i>Echinomuricea sp.</i>	23	0	0	0	22°15'17.90N	114°07'52.94E
20	<i>Echinomuricea sp.</i>	35	0	0	0	22°15'17.89N	114°07'52.89E
21	<i>Echinomuricea sp.</i>	41	0	0	0	22°15'17.85N	114°07'52.86E
22	<i>Echinomuricea sp.</i>	26	0	0	0	22°15'17.88N	114°07'52.78E
23	<i>Echinomuricea sp.</i>	15	0	0	0	22°15'17.85N	114°07'52.71E
24	<i>Echinomuricea sp.</i>	22	0	0	0	22°15'17.79N	114°07'52.64E
25	<i>Echinomuricea sp.</i>	29	0	0	0	22°15'17.77N	114°07'52.60E
26	<i>Echinomuricea sp.</i>	20	0	0	0	22°15'17.71N	114°07'52.60E
27	<i>Echinomuricea sp.</i>	34	0	0	0	22°15'17.70N	114°07'52.57E
28	<i>Echinomuricea sp.</i>	36	0	0	0	22°15'17.69N	114°07'52.52E
29	<i>Echinomuricea sp.</i>	27	0	0	0	22°15'17.67N	114°07'52.51E
30	<i>Echinomuricea sp.</i>	15	0	0	0	22°15'17.66N	114°07'52.51E
31	<i>Echinomuricea sp.</i>	15	0	0	0	22°15'17.64N	114°07'52.50E
32	<i>Echinomuricea sp.</i>	16	0	0	0	22°15'17.59N	114°07'52.49E
33	<i>Echinomuricea sp.</i>	24	0	0	0	22°15'17.65N	114°07'52.57E

Pak Kok Tsui

3.5 Spot dive survey was carried out from 9:00 to 15:00 on 21st October 2022 in PKT (Figure 2). The water depth during the dive survey was 1.5 m to 14 m.

3.6 The survey area is mainly composed of muddy bottom with scattered boulders and rocks along the survey area of PKT. Because of the strong winter monsoon, the sea condition was so rough and the average visibility along the survey area was less than 10 cm or zero during the dive survey.

3.7 No hard coral was recorded in PKT and 53 gorgonian coral colonies *Echinomuricea sp.* were recorded (all located within 3 m of the cable alignment) near the cable alignment. Their GPS coordinates, size and health condition were recorded in **Table 3**. Since the water visibility was nearly zero in most of the time especially water depth more than 6 m, representative photos of corals only taken near the shore and they are shown in Photo Plate B. The recorded coral colonies in the survey area were common gorgonian species in Hong Kong water.

Table 3 GPS Coordinates, Size and Health Condition of Recorded Coral Colonies in PKT during Spot Dive Survey

No.	Coral species	Size (cm)	% Bleaching	Partial Mortality	% Sediment	GPS Coordinates	
1	<i>Echinomuricea sp.</i>	22	0	0	0	22°14'24.08N	114°07'09.33E
2	<i>Echinomuricea sp.</i>	15	0	0	0	22°14'24.13N	114°07'09.33E
3	<i>Echinomuricea sp.</i>	23	0	0	0	22°14'24.14N	114°07'09.33E
4	<i>Echinomuricea sp.</i>	9	0	0	0	22°14'24.14N	114°07'09.33E
5	<i>Echinomuricea sp.</i>	15	0	0	0	22°14'24.17N	114°07'09.37E
6	<i>Echinomuricea sp.</i>	17	0	0	0	22°14'24.18N	114°07'09.39E
7	<i>Echinomuricea sp.</i>	24	0	0	0	22°14'24.22N	114°07'09.41E
8	<i>Echinomuricea sp.</i>	26	0	0	0	22°14'24.22N	114°07'09.41E
9	<i>Echinomuricea sp.</i>	35	0	0	0	22°14'24.21N	114°07'09.43E
10	<i>Echinomuricea sp.</i>	25	0	0	0	22°14'24.21N	114°07'09.47E
11	<i>Echinomuricea sp.</i>	18	0	0	0	22°14'24.23N	114°07'09.49E
12	<i>Echinomuricea sp.</i>	16	0	0	0	22°14'24.27N	114°07'09.52E
13	<i>Echinomuricea sp.</i>	19	0	0	0	22°14'24.28N	114°07'09.55E

No.	Coral species	Size (cm)	% Bleaching	Partial Mortality	% Sediment	GPS Coordinates	
14	<i>Echinomuricea sp.</i>	25	0	0	0	22°14'24.30N	114°07'09.56E
15	<i>Echinomuricea sp.</i>	23	0	0	0	22°14'24.30N	114°07'09.57E
16	<i>Echinomuricea sp.</i>	24	0	0	0	22°14'24.30N	114°07'09.58E
17	<i>Echinomuricea sp.</i>	26	0	0	0	22°14'24.33N	114°07'09.58E
18	<i>Echinomuricea sp.</i>	35	0	0	0	22°14'24.35N	114°07'09.59E
19	<i>Echinomuricea sp.</i>	34	0	0	0	22°14'24.36N	114°07'09.60E
20	<i>Echinomuricea sp.</i>	19	0	0	0	22°14'24.36N	114°07'09.62E
21	<i>Echinomuricea sp.</i>	42	0	0	0	22°14'24.36N	114°07'09.64E
22	<i>Echinomuricea sp.</i>	19	0	0	0	22°14'24.38N	114°07'09.64E
23	<i>Echinomuricea sp.</i>	23	0	0	0	22°14'24.39N	114°07'09.64E
24	<i>Echinomuricea sp.</i>	35	0	0	0	22°14'24.39N	114°07'09.65E
25	<i>Echinomuricea sp.</i>	32	0	0	0	22°14'24.39N	114°07'09.67E
26	<i>Echinomuricea sp.</i>	40	0	0	0	22°14'24.38N	114°07'09.67E
27	<i>Echinomuricea sp.</i>	16	0	0	0	22°14'24.40N	114°07'09.67E
28	<i>Echinomuricea sp.</i>	18	0	0	0	22°14'24.40N	114°07'09.67E
29	<i>Echinomuricea sp.</i>	25	0	0	0	22°14'24.44N	114°07'09.68E
30	<i>Echinomuricea sp.</i>	23	0	0	0	22°14'24.46N	114°07'09.68E
31	<i>Echinomuricea sp.</i>	15	0	0	0	22°14'24.47N	114°07'09.70E
32	<i>Echinomuricea sp.</i>	11	0	0	0	22°14'24.49N	114°07'09.75E
33	<i>Echinomuricea sp.</i>	16	0	0	0	22°14'24.51N	114°07'09.81E
34	<i>Echinomuricea sp.</i>	19	0	0	0	22°14'24.51N	114°07'09.83E
35	<i>Echinomuricea sp.</i>	32	0	0	0	22°14'24.54N	114°07'09.85E
36	<i>Echinomuricea sp.</i>	15	0	0	0	22°14'24.57N	114°07'09.87E
37	<i>Echinomuricea sp.</i>	24	0	0	0	22°14'24.62N	114°07'09.90E
38	<i>Echinomuricea sp.</i>	15	0	0	0	22°14'24.63N	114°07'09.93E
39	<i>Echinomuricea sp.</i>	16	0	0	0	22°14'24.64N	114°07'09.97E
40	<i>Echinomuricea sp.</i>	17	0	0	0	22°14'24.64N	114°07'10.01E
41	<i>Echinomuricea sp.</i>	39	0	0	0	22°14'24.68N	114°07'10.01E
42	<i>Echinomuricea sp.</i>	37	0	0	0	22°14'24.71N	114°07'10.02E
43	<i>Echinomuricea sp.</i>	25	0	0	0	22°14'24.73N	114°07'10.04E
44	<i>Echinomuricea sp.</i>	16	0	0	0	22°14'24.74N	114°07'10.07E
45	<i>Echinomuricea sp.</i>	37	0	0	0	22°14'24.78N	114°07'10.13E
46	<i>Echinomuricea sp.</i>	16	0	0	0	22°14'24.79N	114°07'10.17E
47	<i>Echinomuricea sp.</i>	19	0	0	0	22°14'24.90N	114°07'10.25E
48	<i>Echinomuricea sp.</i>	21	0	0	0	22°14'24.93N	114°07'10.33E
49	<i>Echinomuricea sp.</i>	17	0	0	0	22°14'24.98N	114°07'10.38E
50	<i>Echinomuricea sp.</i>	29	0	0	0	22°14'25.06N	114°07'10.40E
51	<i>Echinomuricea sp.</i>	31	0	0	0	22°14'25.10N	114°07'10.48E
52	<i>Echinomuricea sp.</i>	37	0	0	0	22°14'25.11N	114°07'10.53E
53	<i>Echinomuricea sp.</i>	28	0	0	0	22°14'25.16N	114°07'10.65E

4. Discussion

4.1 The hard substrates in both TB and PKT were mainly composed of sandy and muddy bottom with scattered boulders and rocks. The visibility was nearly zero in most of the time during the survey. A total of 86 gorgonian coral colonies were recorded (TB:33, PKT:53) during the spot dive surveys. All coral colonies during the survey are in good health condition and located within 3 m of the cable alignment. No rare animals were recorded. All coral colonies recorded in the survey area are common species in Hong Kong Water.

4.2 Since some recorded coral colonies are located very close to the cable alignment in both TB and PKT, a number of *Echinomuricea sp.* individuals may be disturbed when the cable is laid. However, the Project Profile revealed that the cable installation for the shore-end cable at landing sites of TB and PKT will be

undertaken using a diver operated hand-held jetting tool. Direct impacts on the coral communities will be avoided by small adjustments to the cable alignment during manual installation. A number of *Echinomuricea* sp. individuals may be disturbed when the cable is laid but afterwards, when the seabed has reformed, *Echinomuricea* sp. will recolonise their former locations and the percentage cover will return to pre-installation levels. Therefore, no translocation of the directly impacted coral colonies will be needed. A post-installation survey will be conducted to verify the health condition of the recorded nearby coral colonies after the cable laying work.

5. References

- Brian Morton and John Morton. 1983. *The Sea Shore Ecology of Hong Kong*. Hong Kong University Press.
- Binnie Consultants Limited. 1995. Marine Ecology of Hong Kong: Report on Underwater Dive Surveys. Volume I. Civil Engineering Department Geotechnical Engineering Office
- Chan A.L.K., Choi, C.L.S., McCorry D., Chan K.K., Lee, M.W., and Put, A. Jr. 2005. *Field Guide to Hard Corals of Hong Kong*. AFCD.

END

Figure 1 Pre-installation Coral Survey Location at TB

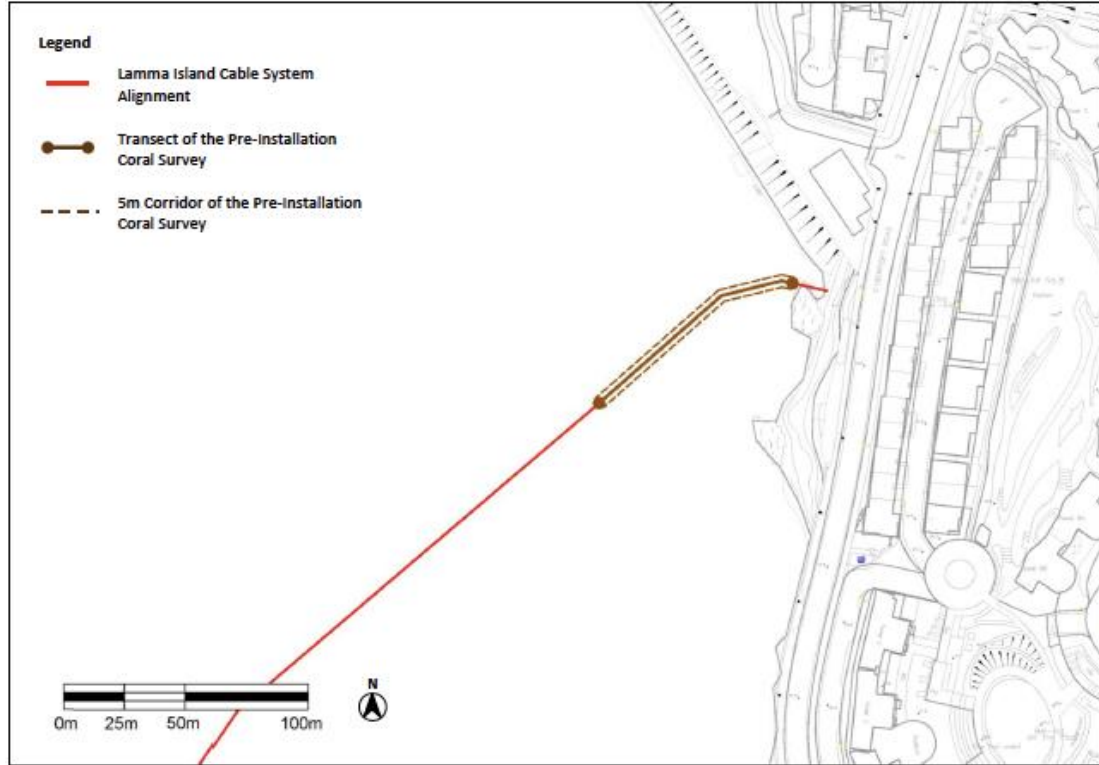


Figure 2 Pre-installation Coral Survey Location at PKT

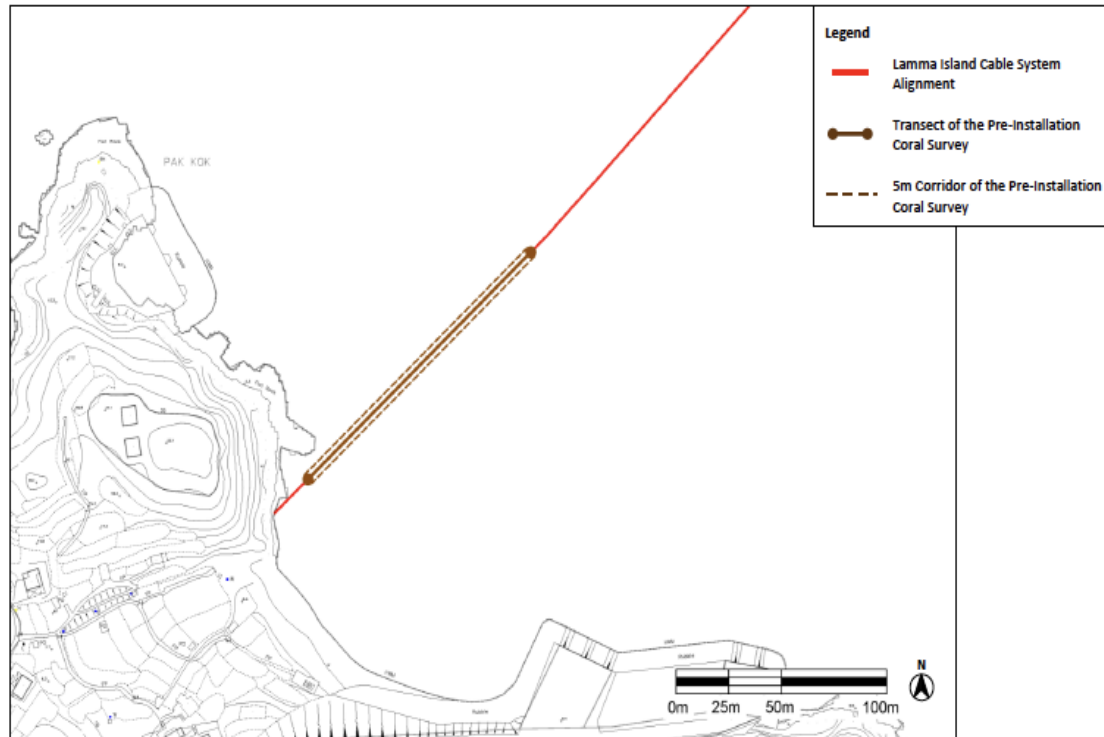


PHOTO PLATE A

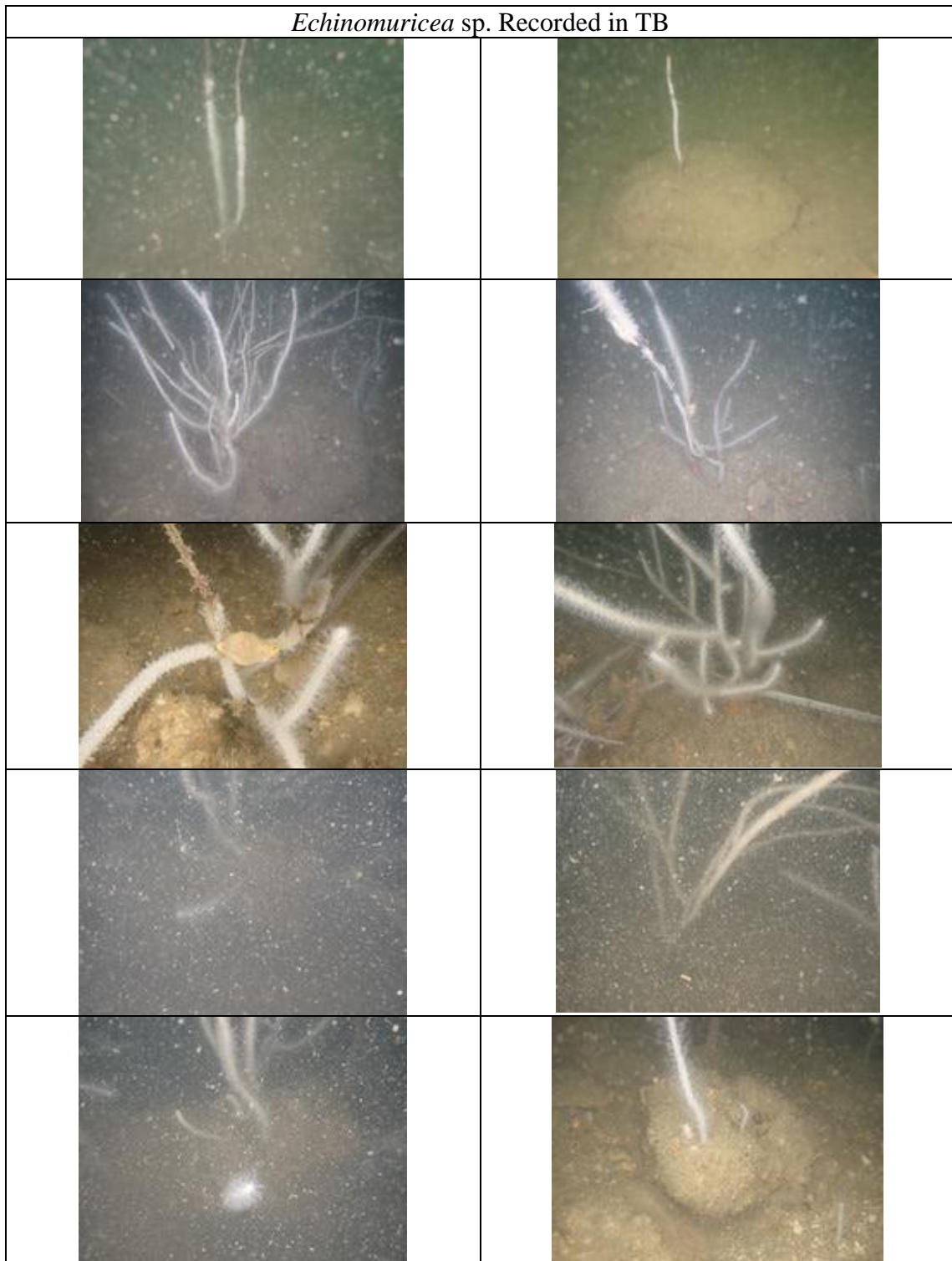


PHOTO PLATE B

<i>Echinomuricea</i> sp. Record in PKT	
