



H2H Express Submarine Cable



Post-Project Coral Survey Report

5 August 2021

Project No.: 0586211

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**Environmental Permit No. EP-575/2020
H2H Express (H2HE) Submarine Cable**

**Environmental Team Leader Certification &
Independent Environmental Checker Verification**

Reference Document/Plan

Document/Plan:	Post Project Coral Survey Report
Date of Report:	5 August 2021
Certified by ET:	ERM-Hong Kong Ltd.
Verified by IEC:	Ecosystems Ltd.

Reference EP Requirement

EP Condition:	Conditions No. 3.4 – 3.5
Content:	<i>Coral Monitoring During Construction Stage</i>
3.4	Coral monitoring shall be conducted to verify that the cable installation works will not result in any unacceptable impacts to the coral colonies in the vicinity of Sha Shek Tan in accordance with the monitoring requirements described in the Project Profile (Register No.: PP-599/2020).
3.5	The Permit Holder shall submit to the Director three hard copies and one electronic copy of the following reports as defined in the EM&A requirements described in the Project Profile (Register No.: PP-599/2020): <ul style="list-style-type: none">(a) Pre-installation coral survey report no later than 2 weeks before the cable laying work is scheduled to commence; and(b) Post-project coral survey report within one month after completion of Post-project coral survey.

ET Certification

I hereby certify that the above referenced document/plan complies with the above referenced condition of EP-575/2020.



Mandy To, Environmental Team
Leader

Date: 5 August 2021

IEC Verification

I hereby verify that the above referenced document/plan complies with the above referenced condition of EP-575/2020.



Dr Vincent Lai, Independent
Environmental Checker:

Date: 5/8/2021

Signature Page

5 August 2021

H2H Express Submarine Cable

Post-Project Coral Survey Report



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1. INTRODUCTION

1.1 Background

The proposed submarine cable is a section of the H2H Express submarine optical fibre cable system (hereafter known as 'H2HE' and / or the Project), which is over 680 kilometers long in total. The system will further boost the external telecommunications capacity of Hong Kong, reinforcing Hong Kong as a key communication hub in Asia. The H2HE submarine cable in HKSAR waters has an approximate burial depth offshore of 2 to 5 m below the sea bed in the HKSAR waters. The total length of the submarine cable within HKSAR waters is approximately 38 km.

The cable will connect to Chung Hom Kok (CHK) within the HKSAR. **China Mobile International (CMI)** is providing the cable landing point and the associated cable landing services in Hong Kong.

The route of the proposed H2HE submarine cable system within Hong Kong SAR is depicted in **Figure 1.1**. The proposed cable would land at an existing Beach Manhole (BMH) location at Sha Shek Tan (SST), CHK, and connect to an existing Cable Landing Station (CLS).

It should be noted that CHK is currently the landing site for a number of submarine cables (i.e. New T&T domestic cable route, C2C Cable network; and SJC). The existing BMH is connected to the CLS on the hill above the landing beach and existing conduits connect the BMH and CLS.

The cable will travel from SST of CHK southward, exiting Stanley Bay, running south-east, passing the Stanley Peninsular, turning east near the south of Po Toi Island, to the eastern boundary of HKSAR waters, where it will enter the South China Sea.

The Project Profile (PP) (PP-599/2020) which includes an assessment of the potential environmental impacts associated with the installation of the submarine telecommunications cable system within HKSAR (including connection to land at CHK) was prepared and submitted to the Environmental Protection Department (EPD) under section 5(1)(b) and 5(11) of the *Environmental Impact Assessment Ordinance* (EIAO) for the application for Permission to apply directly for Environmental Permit (EP). On 17 April 2020, EPD issued a letter to CMI permitting direct application for an environmental permit and following an application, EPD subsequently issued an Environmental Permit (EP-575/2020) on 21 May 2020.

1.2 Objective of the Post-Project Coral Survey

Pursuant to *Conditions 3.1, 3.4 and 3.5 of the EP*, an Environmental Monitoring and Audit (EM&A) programme, as set out in the PP, is required for this Project, with a *Post-Project Coral Survey Report* to be submitted to EPD within one (1) month after completion of post-project coral survey.

The objective of the post-project coral survey is to verify that the cable installation works will not result in any unacceptable impacts to the coral colonies in the vicinity of SST recorded during the Pre-installation Coral Survey in accordance with the monitoring requirements described in the Project Profile.

1.3 Purpose of this Report

This *Post-Project Coral Survey Report* (hereafter known as "the Report") is prepared by ERM-Hong Kong, Limited (ERM) on behalf of China Mobile International Limited to present the methodology and findings of the post-project coral survey for the Project, in accordance with requirements of the *EM&A Manual* appended with the approved PP.

1.4 Structure of this Report

The remainder of the report is structured as follows:

Section 2: Post-Project Coral Survey Methodology

Presents the post-project coral survey methodology, parameters monitored and monitoring locations in accordance with the *EM&A Manual*.

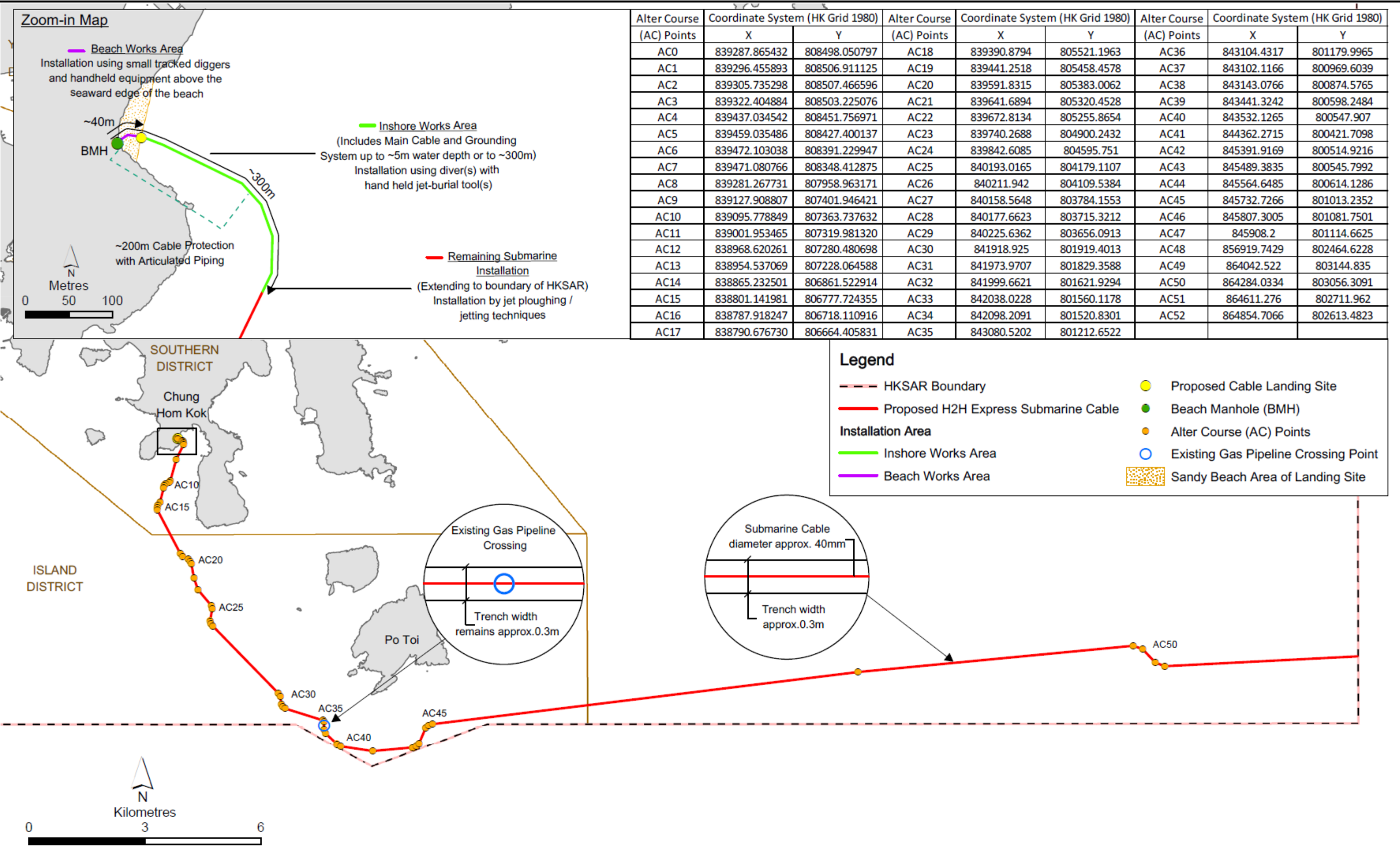
Section 3: Post-Project Coral Survey Results

Summarizes the post-project coral survey results according to the stipulated monitoring methodology in accordance with the *EM&A Manual*.

Section 4: Conclusion

Provides conclusion based on the findings from the post-project coral survey of the Project.

Figure 1.1 Proposed H2HE Cable Route



2. POST-PROJECT CORAL SURVEY METHODOLOGY

2.1 Survey Methodology

One subtidal spot dive survey was undertaken after the completion of the cable installation at the same location of the pre-installation coral survey. The coral survey works were undertaken by the same qualified coral specialists appointed by the Environmental Team (ET) who conducted the pre-installation coral survey of the Project to maintain consistency in the documentation of the coral condition.

2.2 Survey Location

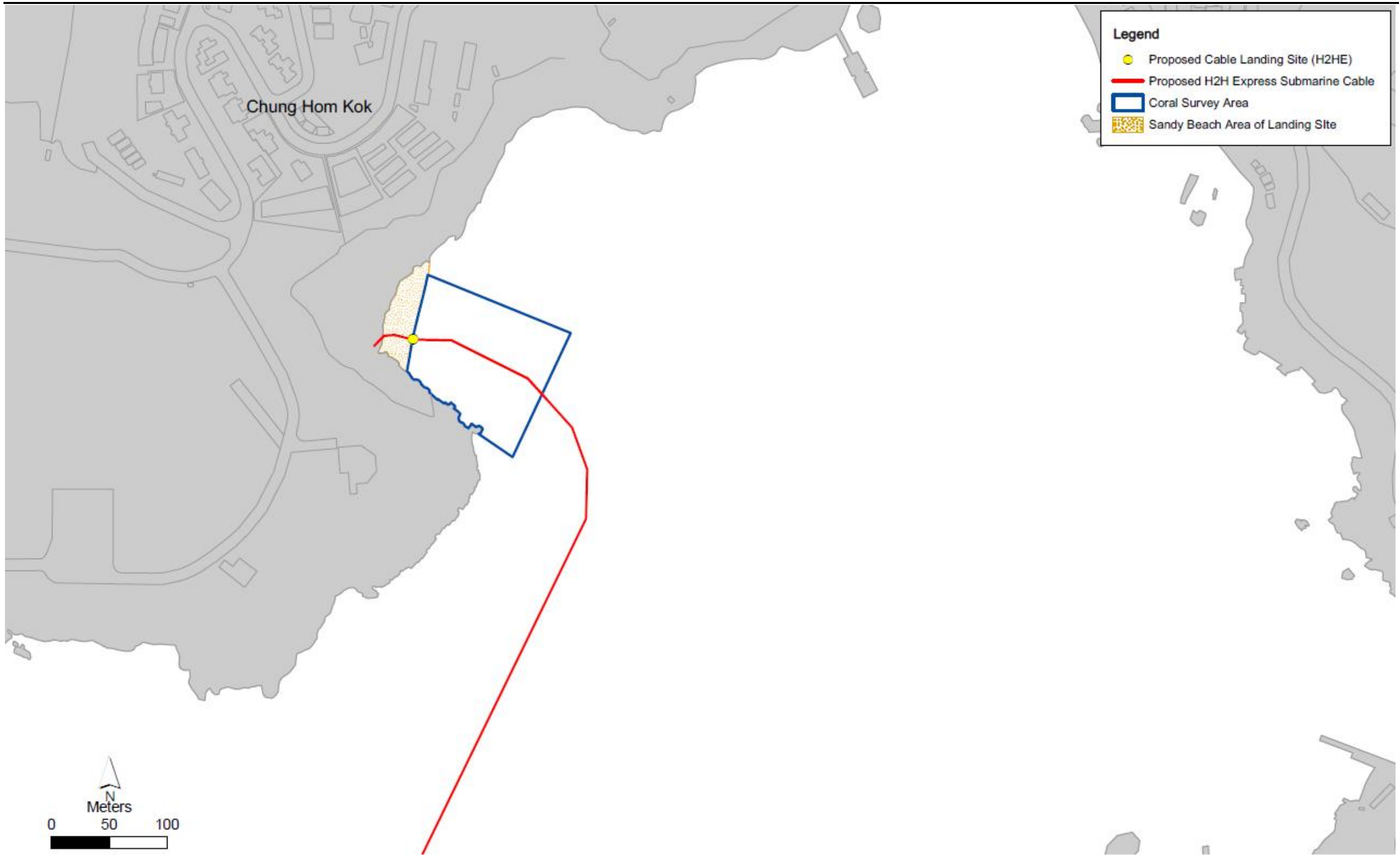
The subtidal spot dive survey was conducted at the Coral Survey Area near the landing site in SST, CHK as shown in **Figure 2.1**. The dive survey focussed on the coral colonies identified in the Pre-installation Coral Survey conducted in March 2021.

2.3 Parameters Monitored

For each coral colony found, the following data were recorded.

- GPS location;
- Species identification to genus or species level, as far as practicable;
- Size (e.g. maximum diameter) and health of identified corals (e.g. degree of sedimentation, partial mortality, sign of bleaching); and
- Photographic record.

Figure 2.1 Location for the Post-project Coral Surveys



3. POST-PROJECT CORAL SURVEY RESULTS

The Post-project Coral Survey was conducted on 15 July 2021 between 9:30 and 17:30 (mainly ebb tide). The weather condition was sunny and the sea condition was fine. The underwater visibility generally ranged between 1 to 2 m. The subtidal spot dive survey was conducted within the Coral Survey Area with water depth ranged from -2 to -10 mCD.

3.1 Survey Results

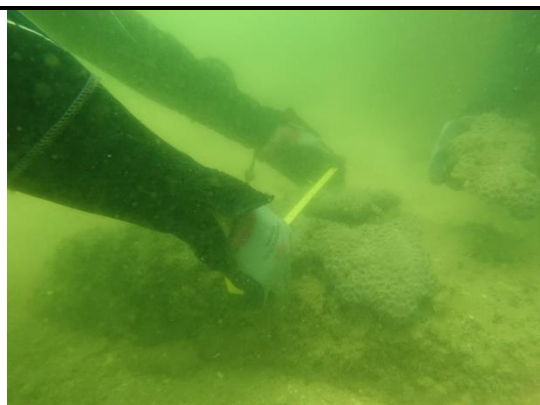
3.1.1 General Description of the Coral Survey Area

Results of subtidal spot dive survey in the Coral Survey Area (**Figure 2.1**) indicated that the seabed was mainly composed of sandy and silty substrates. Hard substrates (i.e. rubbles, boulders or bedrock) were scarcely found at the deeper region (-5 to -10 mCD) (i.e. eastern side of the Coral Survey Area) and also in the shallower region (-2 to -5 mCD) (i.e. west and southwest side of the Coral Survey Area).

The coverage of hard corals was observed to be <5% within the Coral Survey Area. No octocoral or black coral was recorded during the survey. A number of sand bags (about 30 cm L x 30 cm W x 15 cm H), which were not recorded in the Pre-installation Coral Survey, were observed within the Coral Survey Area. There was no observed impact to the coral colonies within the Coral Survey Area due to the presence of sand bags. Overall, there is no change of hard coral coverage when compared to the Pre-installation Coral Survey conducted in March 2021.

Representative photos taken during the Post-project Coral Survey are shown in **Figure 3.1**.

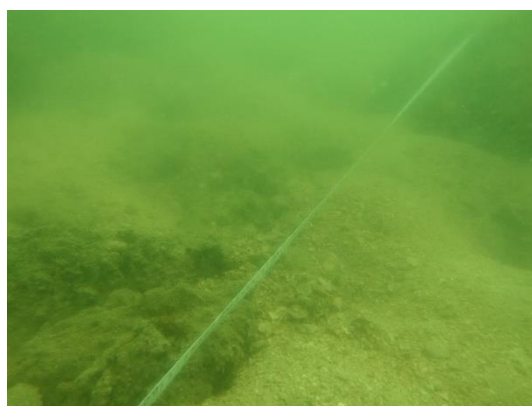
Figure 3.1 Representative Photos Taken during the Subtidal Spot Dive Survey



a) A diver was measuring the diameter of a coral colony.



b) Sand bags were found during the survey.



c) An overview of the substratum in the shallower region (-2 to -5 mCD) of the Coral Survey Area, composed of mainly sandy substrates and boulders / rubbles.



d) An overview of the substratum in the deeper region (-5 to -10 mCD) of the Coral Survey Area, composed of mainly sandy and silty substrates.

3.1.2 Coral Colonies Recorded during the Survey

The 24 nos. of hard corals sighted in the Pre-installation Coral Survey were recorded during the Post-project Coral Survey. Some of the coral colonies showed subtle change in degree of sedimentation, partial mortality and sign of bleaching, however there was no apparent sign of deterioration. Overall, their health conditions, in terms of degree of sedimentation, partial mortality and sign of bleaching, remained similar as recorded in the Pre-installation Coral Survey. Detailed records of the coral colonies are shown in **Table 3.1** and their indicative locations are presented in **Figure 3.2**. Photographic records are provided in **Appendix A**.

3.1.3 Summary

The survey results showed that the 24 hard coral colonies sighted in the Pre-installation Coral Survey were recorded in the Post-project Coral Survey in the vicinity of the proposed cable landing point at SST. Their health conditions, in terms of degree of sedimentation, partial mortality and sign of bleaching, remained similar as recorded in the Pre-installation Coral Survey. Overall, the cable installation works of the Project did not result in any unacceptable impacts to the coral colonies in the vicinity of SST.

Figure 3.2 Location of the Coral Colonies Recorded during the Survey

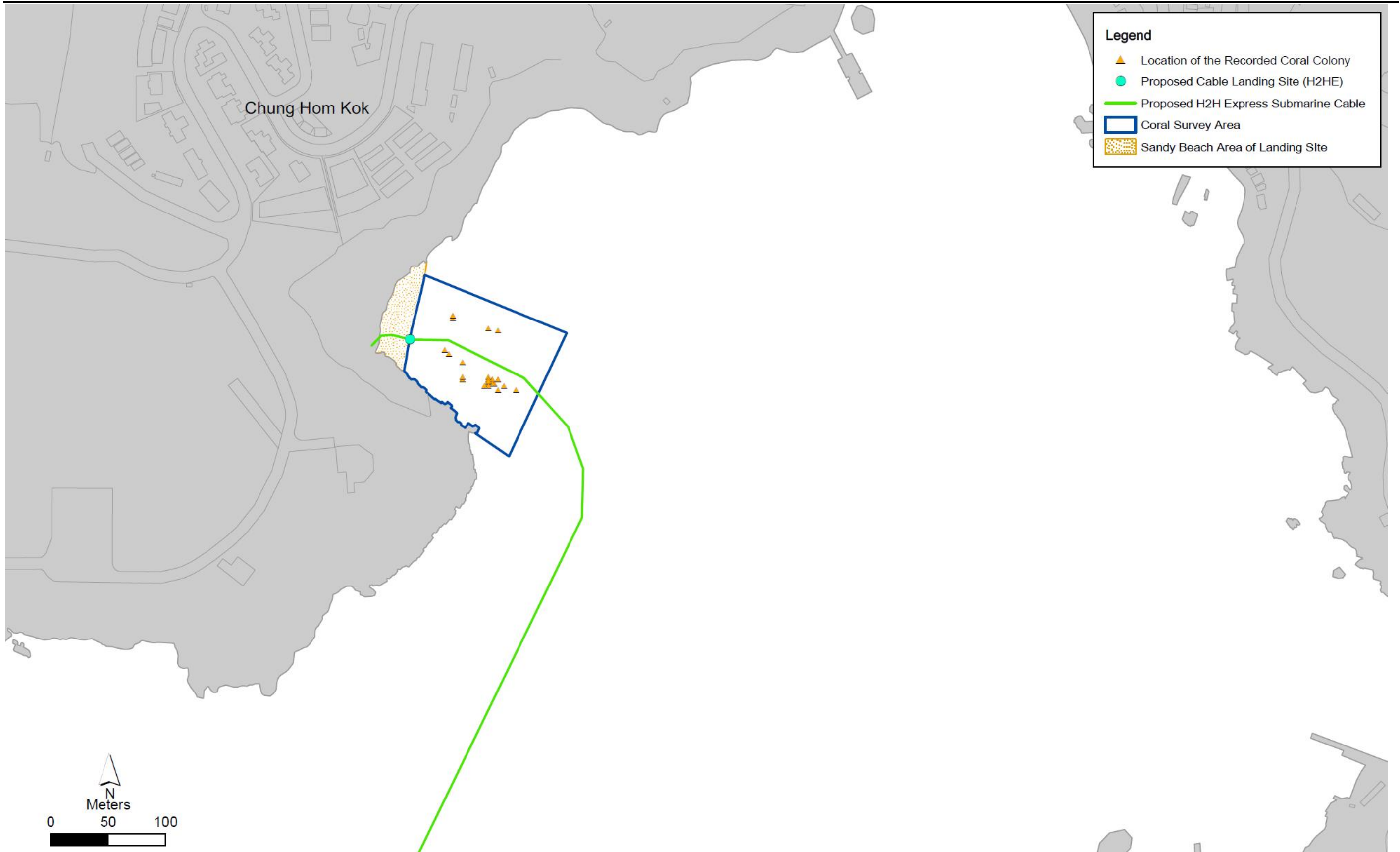


Table 3.1 Species, Size, Sediment Cover, Bleached Area, Partial Mortality and Physical Damage to the Identified Coral Colonies

Coral No.	Family	Genus	Species	Max. diameter (cm)	Max. width (cm)	Sediment cover (%)	Sediment colour	Sediment Texture	Sediment thickness (cm)	Bleached area (%)	Partial mortality (%)	Physical damage to colony	Latitude	Longitude
1	Dendrophylliidae	<i>Turbinaria</i>	<i>peltata</i>	65	54	N/A	N/A	N/A	N/A	N/A	15	N/A	N22°12.889	E114°12.427
2	Merulinidae	<i>Cyphastrea</i>	<i>serailia</i>	12	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N22°12.889	E114°12.437
3	Merulinidae	<i>Cyphastrea</i>	<i>serailia</i>	12	7	N/A	N/A	N/A	N/A	N/A	15	N/A	N22°12.892	E114°12.434
4	Merulinidae	<i>Dipsastraea</i>	<i>lizardensis</i>	31	30	1	Light Yellow	Fine	<1mm	N/A	5	N/A	N22°12.890	E114°12.431
5	Merulinidae	<i>Dipsastraea</i>	<i>lizardensis</i>	22	18	N/A	N/A	N/A	N/A	N/A	0	N/A	N22°12.891	E114°12.429
6	Merulinidae	<i>Dipsastraea</i>	<i>rotumana</i>	33	30	N/A	N/A	N/A	N/A	N/A	5	N/A	N22°12.889	E114°12.429
7	Merulinidae	<i>Favites</i>	<i>abdita</i>	45	26	5	Light Yellow	Fine	1mm	N/A	15	N/A	N22°12.890	E114°12.429
8	Merulinidae	<i>Favites</i>	<i>abdita</i>	40	20	N/A	N/A	N/A	N/A	N/A	40	N/A	N22°12.893	E114°12.416
9	Merulinidae	<i>Favites</i>	<i>chinensis</i>	67	58	N/A	N/A	N/A	N/A	N/A	2	N/A	N22°12.921	E114°12.411
10	Merulinidae	<i>Favites</i>	<i>chinensis</i>	27	13	1	Light Yellow	Fine	<1mm	N/A	10	N/A	N22°12.892	E114°12.416
11	Merulinidae	<i>Favites</i>	<i>pentagona</i>	56	32	10	Light Yellow	Fine	<1mm	N/A	5	N/A	N22°12.904	E114°12.409
12	Merulinidae	<i>Favites</i>	<i>pentagona</i>	58	33	10	Light Yellow	Fine	<1mm	N/A	N/A	N/A	N22°12.906	E114°12.407
13	Merulinidae	<i>Favites</i>	<i>flexuosa</i>	34	29	N/A	N/A	N/A	N/A	N/A	20	N/A	N22°12.890	E114°12.432
14	Merulinidae	<i>Favites</i>	<i>flexuosa</i>	30	26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N22°12.891	E114°12.429
15	Plesiastreidae	<i>Plesiastrea</i>	<i>versipora</i>	40	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N22°12.887	E114°12.443
16	Plesiastreidae	<i>Plesiastrea</i>	<i>versipora</i>	22	20	2	Light Yellow	Fine	<1mm	N/A	5	N/A	N22°12.916	E114°12.429
17	Plesiastreidae	<i>Plesiastrea</i>	<i>versipora</i>	29	16	5	Light Yellow	Fine	<1mm	N/A	5	N/A	N22°12.893	E114°12.429
18	Poritidae	<i>Bernardpora</i>	<i>stutchburyi</i>	32	18	N/A	N/A	N/A	N/A	N/A	10	N/A	N22°12.890	E114°12.431
19	Poritidae	<i>Bernardpora</i>	<i>stutchburyi</i>	30	22	5	Light Yellow	Fine	<1mm	N/A	10	N/A	N22°12.915	E114°12.434
20	Poritidae	<i>Porites</i>	sp.	35	20	5	Light Yellow	Fine	2mm	N/A	30	N/A	N22°12.892	E114°12.431
21	Poritidae	<i>Porites</i>	sp.	28	18	10	Light Yellow	Fine	2mm	N/A	30	N/A	N22°12.892	E114°12.429
22	Psammocoridae	<i>Psammocora</i>	<i>superficialis</i>	23	14	5	Light Yellow	Fine	<1mm	N/A	N/A	N/A	N22°12.887	E114°12.434
23	Scleractinia Incertae sedis	<i>Leptastrea</i>	<i>purpurea</i>	50	24	20	Light Yellow	Fine	1mm	2	10	N/A	N22°12.900	E114°12.416
24	Scleractinia Incertae sedis	<i>Leptastrea</i>	<i>purpurea</i>	19	12	20	Light Yellow	Fine	1mm	N/A	5	N/A	N22°12.922	E114°12.411

4. CONCLUSION

The post-project coral survey was undertaken on 15 July 2021 near the landing site area at Sha Shek Tan (SST) of Chung Hom Kok (CHK) in accordance with the *EM&A Manual* for the Project. Subtidal spot dive survey was undertaken and the survey results showed that the 24 hard coral colonies sighted in the Pre-installation Coral Survey were recorded in the Post-project Coral Survey in the vicinity of the proposed cable landing point at SST. Their health conditions, in terms of degree of sedimentation, partial mortality and sign of bleaching, remained similar as recorded in the Pre-installation Coral Survey. Overall, the cable installation works of the Project did not result in any unacceptable impacts to the coral colonies in the vicinity of SST.

APPENDIX A PHOTOGRAPHIC RECORDS



Coral No. 1
Turbinaria peltata



Coral No. 2
Cyphastrea serailia



Coral No. 3
Cyphastrea serailia



Coral No. 4
Dipsastraea lizardensis



Coral No. 5
Dipsastraea lizardensis



Coral No. 6
Dipsastraea rotumana



Coral No. 7
Favites abdita

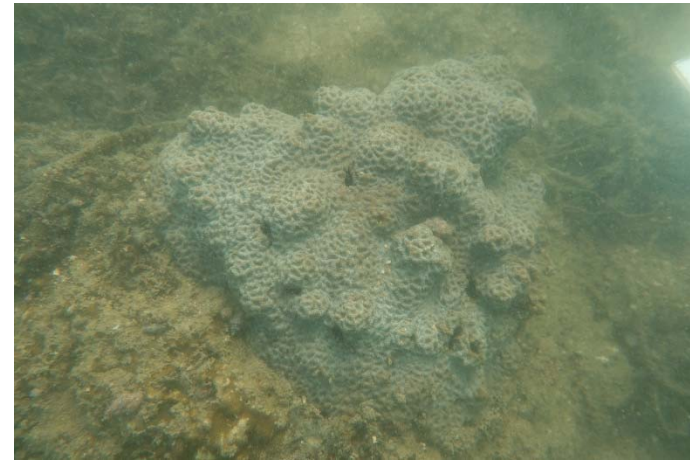


Coral No. 8
Favites abdita

Note: Representative photographs are presented for each recorded coral colony.



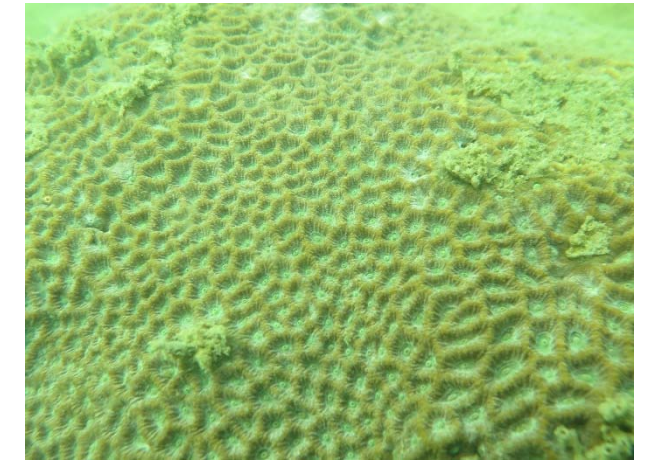
Coral No. 9
Favites chinensis



Coral No. 10
Favites chinensis



Coral No. 11
Favites pentagona



Coral No. 12
Favites pentagona



Coral No. 13
Favites flexuosa



Coral No. 14
Favites flexuosa



Coral No. 15
Plesiastrea versipora



Coral No. 16
Plesiastrea versipora

Note: Representative photographs are presented for each recorded coral colony.



Coral No. 17
Plesiastrea versipora



Coral No. 18
Bernardpora stutchburyi



Coral No. 19
Bernardpora stutchburyi



Coral No. 20
Porites sp.



Coral No. 21
Porites sp.



Coral No. 22
Psammocora superficialis



Coral No. 23
Leptastrea purpurea



Coral No. 24
Leptastrea purpurea

Note: Representative photographs are presented for each recorded coral colony.

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