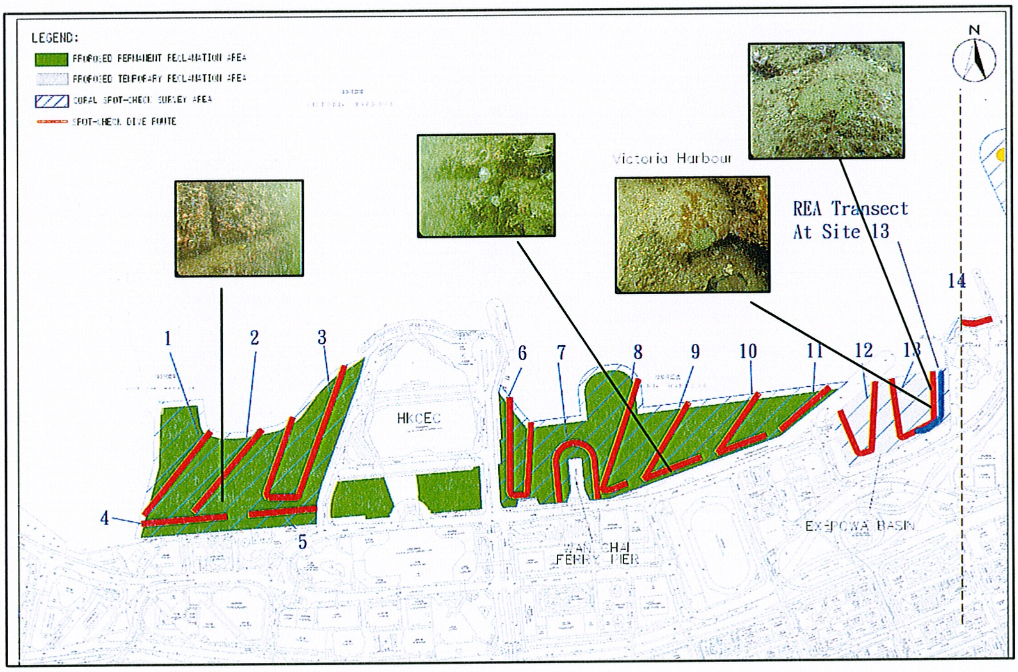
Appendix 9.1
Spot-check Reconnaissance Dives and Rapid Ecological Assessment Survey

Agreement No. CE 54/2001 (CE)
WAN CHAI DEVELOPMENT PHASE II AND CENTRAL-WAN CHAI BYPASS ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

SPOT-CHECK RECONNAISSANCE DIVES AND RAPID ECOLOGICAL ASSESSMENT SURVEY



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Summary

- Spot-Check Dives Survey were carried out at 29 sites from Western side of Wan Chai Exhibition Centre till the Eastern side of Causeway Bay Typhoon Shelter.
- Besides the rubble seawall and rocky shore at Kellet Island, the seabed of the survey sites are mainly muddy and sandy and supported with limited marine lives (tube anemone only). All the rubble seawalls and boulder/rock substrates were dominated by common sponges, tubeworms and bryozoans. The animals found are in low abundance, low diversity and sparsely distributed.
- Only one hard coral species *Oulastrea crispata was* found at Site 13. It is a common coral species widespread across Hong Kong waters and is known to withstand harsh marine environment..
- Only one colony of octocoral: *Echinomuricea* sp.:was found on the rubble seawall of Site 27 with the size around 25cm in diameter.
- REA surveys were carried out at Sites 13 and 27. A 100 meter transect was laid parallel to the shore at the area where corals were found during spot-check dives.
- At Site 13, eighteen *Oulastrea crispata* colonies were found. They are of very small size (about 3 to 8cm) and found in low coverage (1-5%). All of them are grown on small rocks or boulders less than 50cm in diameter.
- At Site 27, only one gorgonian: *Echinomuricea* sp. was found during the REA survey. It was in fair condition with size around 25cm in diameter.
- The corals found at the above 2 sites are common species found across Hong Kong waters including the more turbid and harsh western waters. Owing to the sparse cover, small size, low species richness and commonness of the coral species found, the marine habitats at sites 13 and 27 are considered as having low ecological value. No rare species were recorded during the surveys.
- As an additional measure to protect corals, it is recommended to translocate all the *Oulastrea crispata* and *Echinomuricea* sp. colonies found at sites 13 and 27 to other nearby areas with suitable marine habitats, such as Junk Bay.

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Tables, Figures and Appendixes

1. Introduction

1.1 The proposed reclamation area in Wan Chai Development Phase II and Central-Wan Chai Bypass Project has been subjected to extensive sewage pollution in the past decades. Recent dive surveys for the Harbour Area Treatment Scheme (HATS) (Oceanway, 2003) reviewed that no coral communities were found within the Victoria Harbour area (North Point) and those subtidal and intertidal fauna recorded were either common, i.e., *Perna viridis* dominated community, or of low ecological value, i.e., muddy bottom which support limited marine lives.

1.2 Concerning about the habitat loss due to the reclamation work, it was decided to carry out further subtidal dive surveys in and within the vicinity of the proposed reclamation area to collect updated ecological information for project evaluation. Spot-Check dives and REA Survey were conducted along the proposed reclamation area in order to provide a quick assessment about the seabed environment and subtidal habitats, such as coral assemblage at the area. The size, type, species and condition of corals, if found and their translocation feasibility was also recorded during the field surveys.

2. Methodology

Spot-check Reconnaissance Dives

2.1 Spot-check dives covered (1) the entire temporary and permanent reclamation areas (including 30m seawall formation areas) and areas of 10m outside the work boundary; (2) are of proposed temporary breakwaters and 10m vicinity areas from both existing and proposed breakwaters; (3) area of 10m from northern shoreline of Kellet Island. The locations of proposed reclamation areas and spot-check survey areas are presented in Figure 1 & 2. More details surveys were carried out in the areas of intertidal habitats and subtidal habitats near coastal area where suitable substratum for coral colonization are located.

2.2 For each dive, the following information was recorded:

- locations (GPS);
- distance surveyed;
- visibility;
- number of coral colonies;
- sizes of coral colonies;
- estimate of % hard coral and soft coral cover;
- colonies health condition;
- coral colonies translocation feasibility;
- conservation status of coral species in Hong Kong waters.

2.3 In this way, areas with corals were located and suitable locations to carry out the REA surveys were determined.

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2.4 A 100m horizontal transects were set following the contour of the seabed at area according to the corals communities that found in the Spot-Check Site.

2.5 The benthic cover, taxon abundance, and ecological attributes of the transect above were recorded in a swathe 2 m wide, 1 m either side of the transects, following the Rapid Ecological Assessment (REA) technique (Appendix A).

2.5 Photographs of representative coral species in the surveyed areas were also taken using an underwater digital camera.

2.6 Information concerning the physical nature of the surveyed site was recorded during the survey. This consisted of observations regarding the degree of exposure of the site to wave action, the nature of the substrate type and the topographic profile of the sites.

3. Result

Spot-check Reconnaissance Dives

3.1 The spot-check dives were carried out on 8th – 9th January 2007 and the weather conditions were summarized in Table 1.

Table 1 Weather Condition for the Spot-Check Dives on 8th and 9th January 2007

Date	Condition	Average Underwater Visibility
08 January 2007	- Northeast force 4 to 5, occasionally 6 offshore - Sunny periods	1.5m
09 January 2007	- North force 5, occasionally force 6 - Fine and dry	1.5m

3.2 A total of 29 spot-check dives were carried out during the 2-day surveys (Figure 1 and 2). The GPS location, route distance, maximum depth, bottom substrate and bottom visibility each surveyed sites were summarized in Table 2.

Table 2 GPS Location, Route Distance, Maximum Depth Bottom Substrate and Bottom Visibility of Spot-Check Dive Sites 1 to 29

Site	Location (GPS) (Starting Point)	Route Distance (m)	Max. Depth (m)	Bottom Substrate	Visibility (m)
1	E 114°10’09.0” N 22°16’60.0”	120	6	Muddy/Sandy	1.5
2	E 114°10’11.1” N 22°16’59.6”	120	6	Muddy/Sandy	1.5
3	E 114°10’13.6”	320	6	Muddy/Boulder	1

	N 22°17'00.8"				
4	E 114°10'04.8" N 22°16'53.3"	100	4	Rubble Seawall/Muddy	1.5
5	E 114°10'11.1" N 22°16'54.2"	100	4	Rubble Seawall/Muddy	1.5
6	E 114°10'28.7" N 22°17'01.4"	220	8	Boulder/Muddy	1
7	E 114°10'33.3" N 22°16'55.6"	150	7	Muddy/Sandy	1.5
8	E 114°10'35.5" N 22°17'02.7"	200	8	Muddy/Rubble Seawall	1
9	E 114°10'39.3" N 22°17'01.1"	150	6	Muddy/Rubble Seawall	1
10	E 114°10'42.8" N 22°17'01.4"	120	6	Muddy/Rubble Seawall	1
11	E 114° 10'44.9" N 22°16'59.6"	100	6	Rubble Seawall/Muddy	1
12	E 114°10'48.3" N 22°17'00.1"	120	5	Rubble Seawall/Muddy	1.5
13	E 114°10'51.6" N 22°17'04.9"	150	6	Boulder/Muddy	2
14	E 114°10'55.7" N 22°17'05.3"	50	3	Boulder	1
15	E 114°11'01.6" N 22°17'16.9"	170	8	Muddy	1
16	E 114°11'06.8" N 22°17'17.7"	120	8	Muddy	1
17	E 114°11'13.0" N 22°17'18.5"	120	8	Muddy	1
18	E 114°11'02.2" N 22°17'08.8"	200	4	Boulder	1.5
19	E 114°11'03.6" N 22°17'10.8"	120	4	Boulder	1.5
20	E 114°11'10.9" N 22°17'12.7"	200	4	Boulder	1.5
21	E 114°11'10.1" N 22°17'11.2"	120	3	Boulder	1.5
22	E 114°10'59.9" N 22°16'57.3"	300	5	Muddy	1
23	E 114°10'04.8" N 22°17'05.6"	400	5	Muddy/Rubble Seawall	1
24	E 114°11'14.6" N 22°17'12.0"	150	5	Muddy	1
25	E 114°11'17.3" N 22°17'14.7"	120	5	Muddy/Rubble Seawall	1

26	E 114°11'18.8" N 22°17'15.5"	120	6	Rubble Seawall/Muddy	1.5
27	E 114°11'22.9" N 22°17'19.5"	120	6	Rubble Seawall/Muddy	1.5
28	E 114°11'28.4" N 22°17'26.0"	200	7	Muddy/Rubble Seawall	1
29	E 114°11'30.4" N 22°17'24.7"	200	6	Muddy	1

3.3 In all the 29 spot-check sites, the bottom substrates are mainly muddy, sandy or composed with rubble seawalls. Boulders and rocks were found at sites 3, 6, 13, 14 and 18 to 21. Common sponges (Figure 3) could be found in all the 29 sites. Rubble seawalls were dominated by sponges and over 80% coverage was recorded especially at sites 4, 5, 9, 10, 11, 26 and 27 (Appendix B). At site 6 under the Wan Chai StarFerry Pier, all the pier pilings were fully covered with sponges, green mussels: *Perna viridis* (Figure 4) and bryozoans (Figure 5). Besides, in most of the survey sites, a tubeworm, *Sabelastarte japonica* (Figure 6a and 6b) was found on the rubble seawalls and boulders. Green sea urchins: *Salmacis sphaeroides* (Figure 7) could be found on the boulders of site 14 and site 18 to 21. The long spin sea urchin: *Diadema setosum* (Figure 8) and purple sea urchin: *Anthocidaris crassispina* (Figure 9) were found on the boulders of site 13. All animals found in the above sites were common species, occurred in low abundance and sparsely distributed. No rare or species of conservation value were recorded during the survey.

3.4 For the muddy bottoms (Figure 10a), they were dominated by common tube anemone: *Cerianthus filiformis* (Figure 10b and 10c). It could be found at all sites with muddy bottoms.

3.5 The horizontal visibility at site 13 was around 2m and this was the site with best visibility when compared with other sites. Isolated patches of hard coral *Oulastrea crispata* was found at site 13 (Table 3). This is the only one species that was found during the spot-check dives. This species can be commonly found in Hong Kong water including the more turbid and harsh western waters. Four *Oulastrea crispata* (Figure 11a and 11b) colonies of very small size (about 3 to 8cm in diameter) were found during the survey. They were in very low coverage (<1%) and all of them are in fair condition. More detailed studies at site 13 were carried out during REA survey.

3.6 At site 27, the horizontal visibility was around 1.5m and only one colony of octocoral (gorgonian) *Echinomuricea* sp. (Figure 12) was found during the spot-check survey (Table 3). The size of the coral colony is about 25cm in diameter and attached to the rubble seawall. *Echinomuricea* sp. is commonly found in southern to western part of Hong Kong water. More detailed studies at site 27 were carried out during REA study.

Table 3 Species, Coverage and Size of Corals Found at Spot-Check Site 13 and Site 27

Site	Coral species	Coverage	Size (Diameter)
13	*Oulastrea crispata*	<1%	3cm to 8cm
27	*Echinomuricea* sp.	<1%	25cm

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3.7 The survey was performed on 12th January 2007 for site 13 and 27. The weather was cloudy and the sea was windy and the visibility was fair (approximately 1.5m). A 100m transect was laid at the area with coral found during the spot-check dive survey (Figure 1 and 2).

Table 4 Weather Condition for the REA Survey on 12th January 2007

Date	Condition	Average Underwater Visibility
12 January 2007	- Northeast force 5, occasionally 6 offshore - Cloudy	1.5m

Table 5 GPS of Transect Starting and Ending, Maximum Depth, Bottom Substrate and Bottom Visibility of Site 13 and 27

Site	Location (GPS) (Starting Point)	Location (GPS) (End Point)	Max. Depth (m)	Bottom Substrate	Visibility (m)
13	E 114°10'53.7" N 22°16'59.2"	E 114°11'23.8" N 22°17'19.4"	4	Boulders/Sandy	1.5
27	E 114°10'54.0" N 22°17'02.5"	E 114°11'26.8" N 22°17'22.8"	6	Muddy/Seawalls	1.5

Site 13

3.8 A 100m transect was laid down along the coral area of site 13 (Figure 1). The start point was the end of the seawall and the end point was the pier next to the Hong Kong Yacht Club.

3.9 This site is mainly composed of boulders down to 2 meters depth along the surveyed route (Table 6). Areas deeper than 2 meters are mainly muddy and sandy bottoms. The site supported limited marine life (tube anemone). Only some common sponges (Figure 13), sea anemone: *Actinia equina*. Sea urchins: *Diadema setosum*, and *Anthocidaris crassispina* were found at the surface of the boulders.

Table 6 REA Ecological and Substratum attributes of Site 13

Ecological attributes	Rank
Hard coral	0.5
Octocoral (soft corals and gorgonians)	0
Black Corals	0
Dead standing corals	0

Substratum Attributes	
Bedrock/continuous pavement	1
Boulder Blocks (diam.>50cm)	3
Boulder Blocks (diam.<50cm)	1
Rubble	0
Other	0
Soft Substrata	0
Sand	0
Mud/Silt	1

* Rank of percentage cover: 0 = None recorded; 0.5 = 1-5%; 1 = 6-10%; 2 = 11-30 %; 3 = 31-50%; 4= 51-75 %; 5 = 76-100%.

3.10 The site supported a sparse and patchy cover (1-5%) of hard coral. A total of eighteen coral colonies (Table 7) were found during the REA survey and most of them are located on the boulders and rock next to the pier of Hong Kong Yacht Club (Figure 14a and 14b). They were of very small size (about 3 to 8 cm in diameter), in low coverage and all belonged to a single species *Oulastrea crispate.*. All the corals are in fair condition.

Table 7 Size, Distance Along the Transect, Health Condition and Translocation Feasibility of Coral Colonies found at Site 13

Coral Number	Coral Species	Size	Distance along the transect (m)	Health Condition	Translocation feasibility
1	*Oulastrea crispata*	5	5	Fair	Yes
2	*Oulastrea crispata*	3	15	Fair	Yes
3	*Oulastrea crispata*	5	27	Fair	Yes
4	*Oulastrea crispata*	6	34	Fair	Yes
5	*Oulastrea crispata*	3	50	Fair	Yes
6	*Oulastrea crispata*	3	56	Fair	Yes
7	*Oulastrea crispata*	5	64	Fair	Yes
8	*Oulastrea crispata*	5	64	Fair	Yes
9	*Oulastrea crispata*	7	72	Fair	Yes
10	*Oulastrea crispata*	6	74	Fair	Yes
11	*Oulastrea crispata*	8	74	Fair	Yes
12	*Oulastrea crispata*	3	80	Fair	Yes
13	*Oulastrea crispata*	5	86	Fair	Yes
14	*Oulastrea crispata*	5	87	Fair	Yes
15	*Oulastrea crispata*	6	89	Fair	Yes

16	*Oulastrea crispata*	8	92	Fair	Yes
17	*Oulastrea crispata*	5	97	Fair	Yes
18	*Oulastrea crispata*	5	97	Fair	Yes

3.11 *Oulastrea crispata* is a very common species of hard coral found in Hong Kong water. It is especially adapted to harsh environment and it can be found in many places in Hong Kong.

Site 27

3.12 A 100m transect was laid along the rubble seawall of Site 27. The maximum depth of this site is around 6 meters. This site is mainly composed of rubble seawalls (Table 8) and muddy bottom when fining away from the seawalls.

3.13 Some common organisms are found in the surfaces of the seawall. These included sponges, bryozoans, and tubeworm, *Sabelastarte japonica*. Tube anemone: *Cerianthus filiformis* was dominated at the muddy bottom of this site. They are all common species, in low abundance and sparsely distributed in the area.

Table 8 REA Ecological and Substratum attributes of Site 27

Ecological attributes	Rank
Hard coral	0
Octocoral (soft corals and gorgonians)	0.5
Black Corals	0
Dead standing corals	0
Substratum Attributes	
Bedrock/continuous pavement	3
Boulder Blocks (diam.>50cm)	1
Boulder Blocks (diam.<50cm)	0
Rubble	0
Other	0
Soft Substrata	0
Sand	0
Mud/Silt	2

* Rank of percentage cover: 0 = None recorded; 0.5 = 1-5%; 1 = 6-10%; 2 = 11-30 %; 3 = 31-50%; 4= 51-75 %; 5 = 76-100%.

3.14 Only one colony of octocoral: *Echinomuricea* sp. (Table 9) was found during the REA survey and it is located next to a public pier (Figure 15) about 250m away from Causeway Bay Typhoon Shelther. *Echinomuricea* sp. is a common gorgonian coral found in Hong Kong water especial more turbid waters such as southern and western parts.

Table 9 Size, Distance Along the Transect, Health Condition and Translocation Feasibility of Coral Colonies found at Site 27

Coral Number	Coral Species	Size	Distance along the transect (m)	Health Condition	Translocation feasibility
1	*Echinomuricea* sp.	25	75	Fair	Yes

4. Discussion

Spot-check Reconnaissance Dives

4.1 The hard substrates of the survey sites were many composed with rubbles seawalls and boulders/rocks only appeared at sites 3, 6, 13, 14 and 18 to 21. Muddy bottoms were appeared at all the 29 surveyed sites.

4.2 At all the 29 spot-check sites, only limited marine life were found. Some common organisms, such as sponges, bryozoans, green mussels and tubeworms were found at the hard substrates. Muddy substrates were dominated by tube anemone. They are all common species and found in very low abundance and diversity.

4.3 Only one species of hard coral: *Oulastrea crispata* and one species of octocoral: *Echinomuricea* sp. were recorded at sites 13 and 27 respectively. REA surveys were required to carry out at these 2 sites for further detailed study.

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Site 13

4.4 Site 13 is located at the western side of the Hong Kong Yacht Club. The site is characterized by 2 side of rubble seawalls and one side with boulder shore and left one side for current to come in and out the bay. Therefore, it is well protected from any wave action.

4.5 There were 18 *Oulastrea crispata* colonies found at this site. They were of very small size (about 3 to 8cm in diameter) and in low coverage. Most of the colonies were found next to the small pier of the Hong Kong Yacht club. All the coral colonies were either attached to small rocks or boulders less than 50cm in diameter.

4.6 Other than isolated patches of small coral colonies, common marine invertebrate such as sea urchins: *Diadema setosum* and *Anthocidaris crassispina*, sponges, tubeworms: *Sabelastarte japonica* and sea anemone *Actinia equine* were found at site 13.

4.7 The abundance and species diversity of invertebrates found in site 13 is relatively low when compared with other areas. Only one single coral species was found and this species is common across Hong Kong waters and tolerant to more turbid and harsh environment. The site is considered as having low ecological value given the low abundance and species diversity of marine fauna found in the area. .

Site 27

4.8 Site 27 was located at about 250m away from the Causeway Bay Typhoon Shelter to the east. It's a semi-exposed rubble seawall where wave action from traveling boat occurred quite often during the daytime.

4.9 This site is mainly composed of rubble seawall along the transect line. Some organisms, such as sponges, bryozoans and tubeworm were found during the survey. They were all common species in Hong Kong waters and occurred in low abundance and diversity.

4.10 One common gorgonian coral: *Echinomuricea* sp. was found at this site with size around 25cm in diameter. The coral was attached directly to the rubble seawall at around 75m along the 100 transect line.

4.11 Apart of the single colony of gorgonian, site 27 also displays a low diversity and species richness of invertebrates. The overall ecological value of this site is low..

5. Recommendations

5.1 The proposed works would result in permanent loss of subtidal habitats and the dive surveys indicated that they are all mainly muddy and sandy sea bottom supported with limited marine life. Only sparse and patches cover (1-5%) of a single hard coral (*Oulastrea crispate)* and gorgonian species (*Echinomuricea* sp) were found at sites 13 and 27. The corals found at these 2 sites are widespread and common across Hong Kong waters including more turbid and harsh environment in the western waters. Owing to their commonness, sparse cover (1-5%), small size and occurred in low species diversity and richness, the marine ecological habitats of the 2 sites were of low ecological value. The survey also noted that the potentially impact corals are attached to movable small boulders and it is technical feasible to translocate them to avoid any direct loss. As an additional measure to protect the corals, translocation of the corals found at sites 13 and 27 is recommended.

5.2 In considering the species composition and hydrology (e.g. water depth, substrate, etc), it is recommended that Junk Bay which possess healthy coral communities including *Oulastrea crispata* and *Echinomuricea* sp (HATS EIA, Oceanway 2003 and Dive Survey Reports, Binnie 1995) will be a suitable recipient site for translocating the affected corals.

6. 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

Katharina Fabricius and Philip Alderslade 2001. *Soft Corals and Sea Fans: A comprehensive guide to the tropical shallow-water genera of the Central-West Pacific, the Indian Ocean and the Red Sea.* AIMS.

The Oceanway Corporation Ltd. 2003. *Report: Field Diving Surveys of Corals for the Environmental and Engineering Feasibility Assessment Studies (EEFS) in Relation to the way forward of The Harbour Area Treatment Scheme (HATS).*

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.

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Figure 1 Spot-Check Dive Sites and REA Site – 1

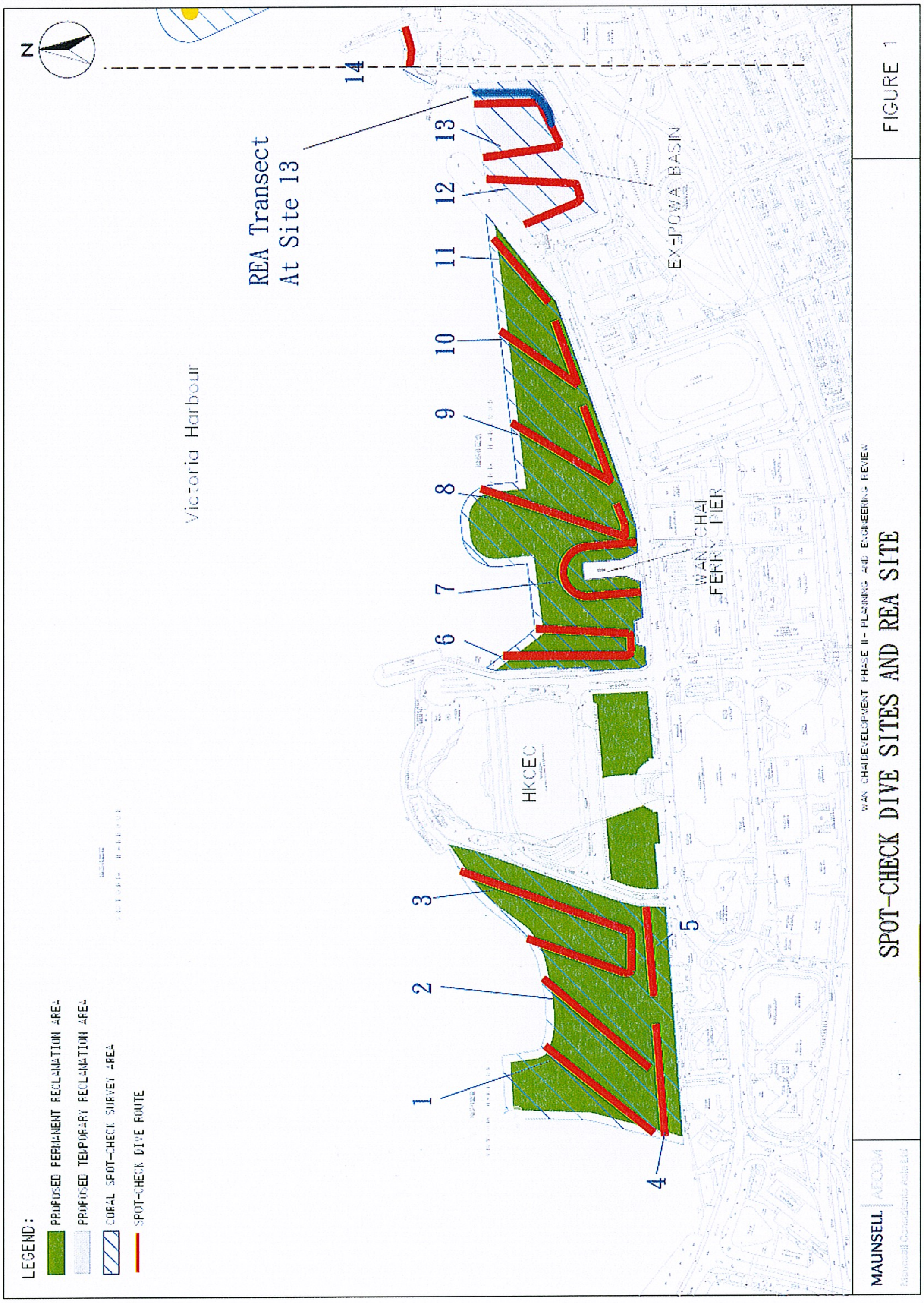

Figure 2 Spot-Check Dive Sites and REA Site - 2

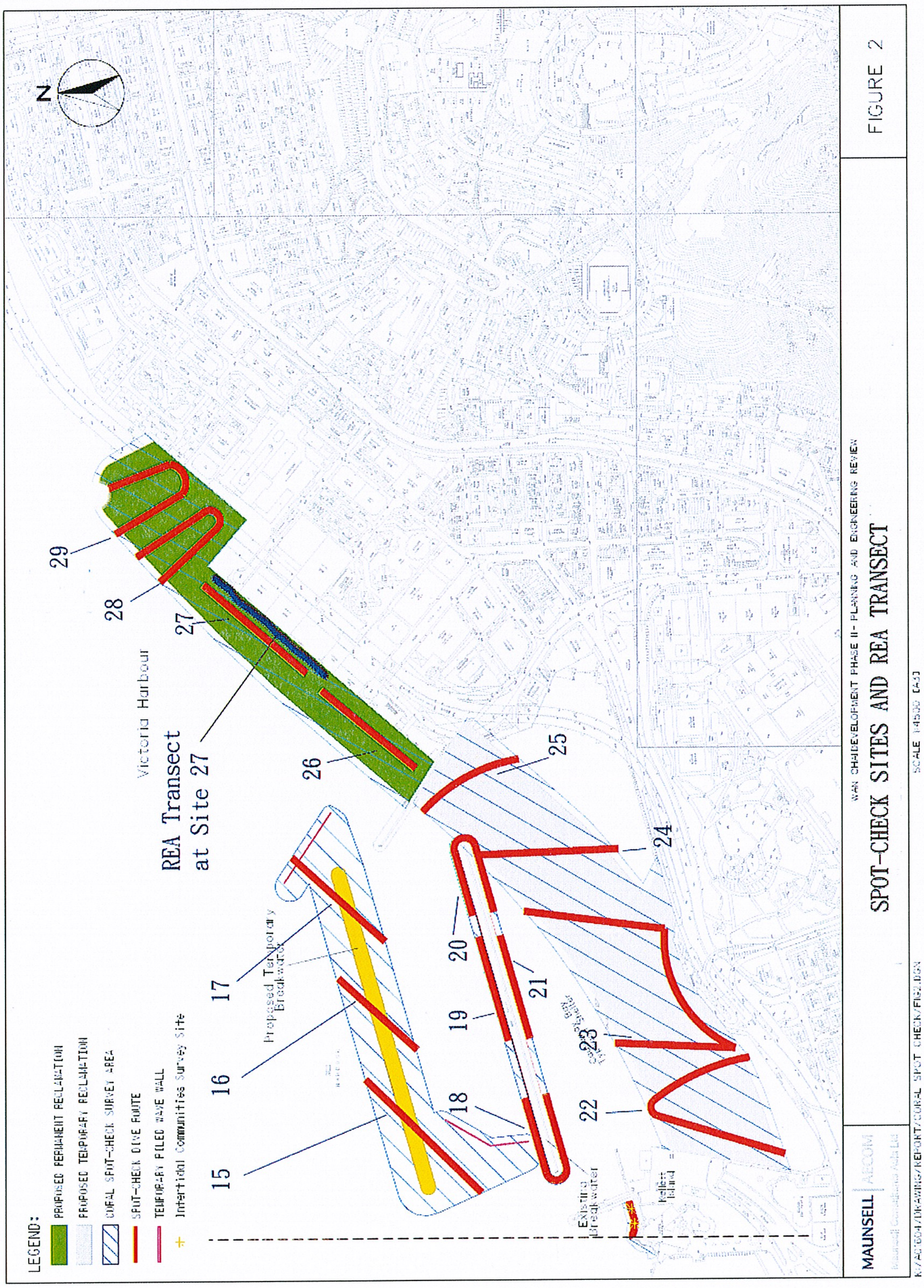

Figure 3. Unknown Sponge

Figure 4. Common Green Mussels

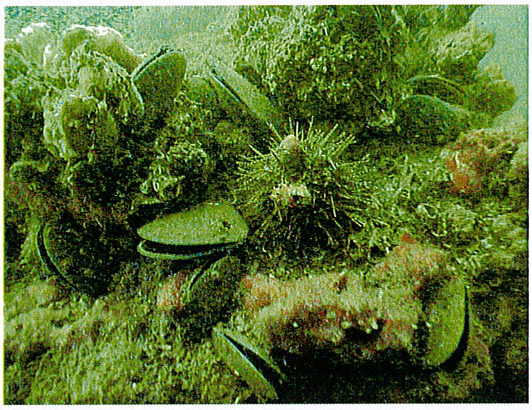

Figure 5. Bryozoans

Figure 6a. Tubeworms

Figure 6b. Tubeworms

Figure 7. Green Sea Urchin

Figure 8. ***Diadema*** **Sea Urchin**

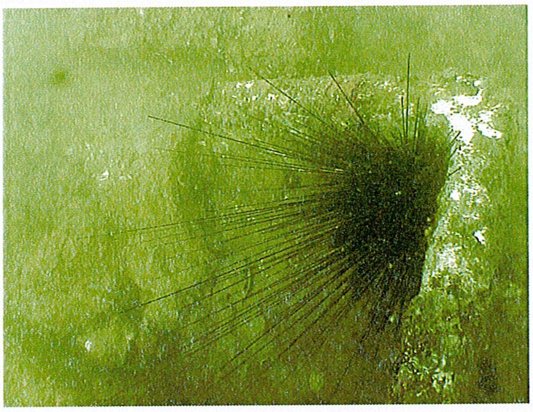

Figure 9. Purple Sea Urchin

Figure 10a. Muddy Bottom

Figure 10b. Tube Anemone

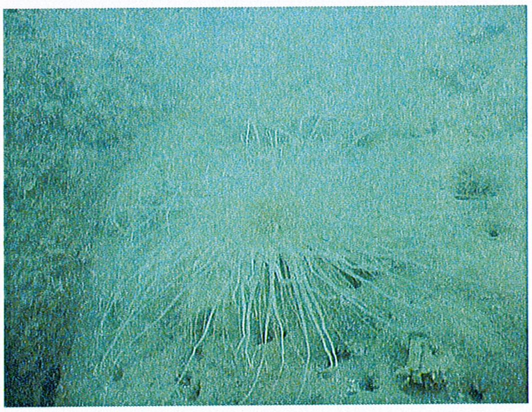

Figure 10c. Tube Anemone

Figure 11a. ***Oulastrea crispata***

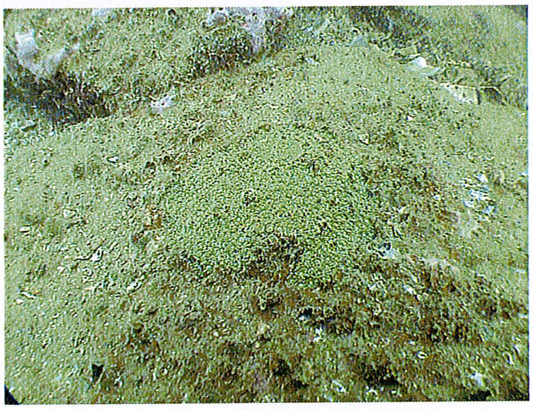

Figure 11b. ***Oulastrea crispata***

Figure 12. ***Echinomuricea* sp.**

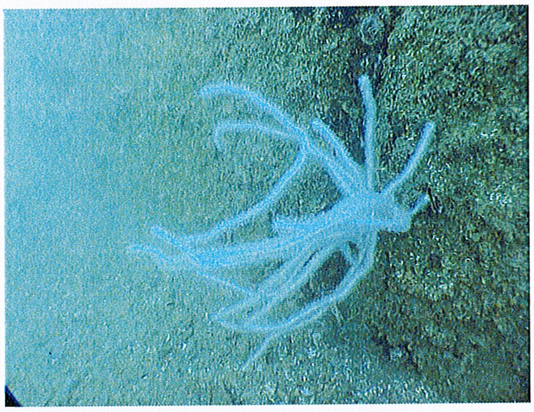

Figure 13. Sponges at Site 13

Figure 14a. Land Mark at Site 13

Figure 14b. Boulders/Rocks at Site 13

Figure 15. Public Pier at Site 27

Appendix A Rapid Ecological Assessment

Five ecological and seven substratum attributes shall be assessed on site and by reviewing video footages. Each of the attributes (Table 1) should be assigned to one of the seven standard ranked categories (from zero to six, representing percentage cover from none to over 76%)(Table 2).

An inventory of benthic taxa should also be complied for the P transect and bounce five points. Taxa shall be identified in situ to the following levels: 1) Hard corals to species level where possible; 2) Soft corals, anemones and macroalgae to genus level where possible; and 3) Other benthos to genus level where possible or phylum with growth form. Each taxon in the inventory shall also be ranked to one of the six categories (Table 3) in terms of abundance (from 0 to 5, representing from absent to dominant) in the community.

Table 1 Ecological and Substratum attributes used in REA

Ecological attributes
Hard coral
Octocoral (soft corals and gorgonians)
Black Corals
Dead standing corals
Substratum
Bedrock/continuous pavement
Boulder Blocks (diam.>50cm)
Boulder Blocks (diam.<50cm)
Rubble
Other
Soft Substrata
Sand
Mud

Table 2 Ranking of Ecological and substratum attributes

Rank	Percentage cover (%)
0	None recorded
0.5	1-5
1	6-10
2	11-30
3	31-50
4	51-75
5	76-100

Table 3 Ranking of Benthos abundance

Rank	Abundance
0	Absent
1	Sparse
2	Uncommon
3	Common
4	Abundant
5	Dominant

Appendix B Dominated Animals and Corals at Spot-Check Sites

Site	Dominated Animals	Coral Species	Coral Rarity
1	Cerianthus filiformis	Nil	-
2	*Cerianthus filiformis*	Nil	-
3	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*	Nil	-
4	Unknown Sponges, *Sabelastarte japonica*	Nil	-
5	Unknown Sponges, *Sabelastarte japonica*	Nil	-
6	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*	Nil	-
7	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*, *Perna viridis*	Nil	-
8	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*	Nil	-
9	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*	Nil	-
10	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*	Nil	-
11	Unknown Sponges, *Sabelastarte japonica*,	Nil	-
12	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*	Nil	-
13	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*, *Diadema setosum*, *Anthocidaris crassispina*	*Oulastrea crispata*	Common
14	Unknown Sponges, *Sabelastarte japonica*, *Anthocidaris crassispina*, *Salmacis sphaeroides*	Nil	-
15	*Cerianthus filiformis*	Nil	-
16	*Cerianthus filiformis*	Nil	-
17	*Cerianthus filiformis*	Nil	-
18	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*, *Salmacis sphaeroides*	Nil	-
19	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*, *Salmacis sphaeroides*	Nil	-
20	Unknown Sponges, *Sabelastarte japonica*, *Cerianthus filiformis*, *Salmacis sphaeroides*	Nil	-
21	Unknown Sponges, *Sabelastarte japonica*, *Salmacis sphaeroides*	Nil	-
22	Unknown Sponges	Nil	-
23	Unknown Sponges, *Cerianthus filiformis*	Nil	-
24	Unknown Sponges, *Cerianthus filiformis*	Nil	-
25	Unknown Sponges, *Cerianthus filiformis*	Nil	-
26	Unknown Sponges, *Cerianthus filiformis*, *Sabelastarte japonica*	Nil	-
27	Unknown Sponges, *Cerianthus filiformis*, *Sabelastarte japonica*	*Echinomuricea* sp.	Common

28	Unknown Sponges, *Cerianthus filiformis*, *Sabelastarte japonica*	Nil	-
29	Unknown Sponges, *Cerianthus filiformis*, *Sabelastarte japonica*	Nil	-

Appendix C Sample of Data Sheet Using at Spot-Check Dive Survey

Site #	GPS	Substrate	Max. Depth	Invertebrates	Visibility

Appendix D Sample of Data Sheet Using at REA Survey

Site Name:			Date:
GPS Location:			Max. Depth:
Starting Point:			Visibility:
			Substrate:
Ending Point:		Dominated Animals:	

Coral sp.	Size	Distance on Transect	Health Condition	Translocation Feasibility