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December 4, 2012

Carter Luke, PE
Engineering Program Manager
Department of Transportation, Harbors Division
79 South Nimitz Highway
Honolulu, HI 967813

RE: Marine Surveys of Pacific Shipyards Dock Areas

Dear Mr. Luke;

Owing to hazardous diving conditions in the vicinity of the Pacific Shipyards International (PSI) working dry docks, the pier structures on Piers 41 and 42 were not included in the original biological assessments of the area of Honolulu Harbor that will be affected by the proposed Kapalama Container Terminal. On November 1, 2012 arrangements were made with PSI to allow divers to conduct an underwater survey of the docks to assess biotic populations inhabiting the area in order to provide complete coverage of the area that will potentially be affected by the proposed activity.

Piers 41 and 42 were designated as "Section H" for the Biological Assessment of the Kapalama Area. For the present evaluation, Section H was further divided into four subsections (H-1, H-2, H-3, H-4) (Figure 1). Sub-section H-1 is the berthing site for the PSI dry dock "KeKaulana", sub-sections H-2 and H-3 are the berthing site for numerous commercial boats, and sub-section H-4 is the berthing site for the PSI dry dock "Kapilipono."

Overall, the physical structure of the entirety of Sector H in Honolulu Harbor is similar to other sectors surveyed in Kapalama basin. The dredged silt bottom and vertical pier wall give very little three dimensional complexity for a reef habitat. As Sector H had the highest density of large vessels moored for extended periods of time, biotic colonization of the pier faces was lowest of any other survey sector of the Kapalama area. Summaries of the observations of each sub-sector are presented below; quantification of coral colony abundance by size-class is shown in Table 1, while fish abundance and biomass is shown in Table 2.

Sub-sector H-1

The pier face comprising Sub-sector H-1consists of corrugated concrete sheet-piling that extends the length of the dry dock KeKaulana, although the dry dock is separated from the pier by a distance of approximately 10 feet. The gap provides exposure to light for at least part of the day, resulting in colonization by some corals, consisting predominantly of small branching

colonies of *Pocillopora damicornis* (Figure 2). Other corals observed were small colonies of *Porites lobata* and *Montipora* spp., *Pavona varians* and *Leptastrea purpurea*. Other macro-invertebrate colonization consisted primarily of small sponges. The fishes observed during the survey were typical of other surveys in the harbor, although abundance was less than in most other sectors. The most abundant fish in Sector H-1 was damselfish *Abudefduf abdominalis*.

Sub-sector H-2

Sub-sector H-2 consists of sheet-piling similar to sub-sector H-1. The majority of the piers in this area are docking space for a number of commercial catamarans that appear to be semi-permanently moored. Coral colonies consisted primarily of small encrustations of *Porites lobata* and *Montipora* spp. (Figure 3, top). The innermost portion of the piers were colonized by numerous small encrustations of *Leptastrea purpurea* (Figure 3, bottom).

Sub-sector H-3

Sub-sector H-3 contains the fewest number of moored vessels which is reflected by the highest cover and diversity of coral of the sub-sectors comprising Sector H. The corrugated face of the pier is colonized primarily by numerous small encrusting colonies of Porites lobata and Montipora spp. Of particular interest is that at the outer facing end of Sub-sector H-3 near the juncture with sub-sector H-4 is the only area within Sector H with development of a community of larger coral colonies (Figure 5, top). This small community consists primarily of larger mound-shaped colonies of Porites lobata, as well as several branching colonies of P. compressa. As no vessels were moored in this area, and the orientation maximizes exposure to direct sunlight, the pier face provides a suitable combination of physical factors for settlement and prolonged growth of coral. Reef fish were also most abundant in this area with the occurrence of a school of ring-tailed surgeonfish (Acanthurus blochii), as well as several other species (Table 2).

Sub-sector H-4

Sub-sector H-4 consists of mooring area for the large PSI dry dock Kapilipono. The dry dock is moored securely against the pier resulting is no exposure to ambient light to the pier and pilings. Inspection of the exposed pier using underwater lights revealed no colonization of corals and only very minor coverage by other invertebrates (Figure 5). Within the arc of the underwater light, five fish were observed during the inspection of the length of the piers underlying the dry-dock (Table 2).

In summary, surveys of the submerged areas of Piers 41 and 42 occupied by PSI dry docks and other moored commercial vessels revealed somewhat similar biotic community structure as observed in other sectors of the piers within the Kapalama basin area of Honolulu Harbor. The principal difference between this sector and much of the other areas of the Harbor is that the continual presence of moored vessels appears to restrict available light, hence restricting the development of larger colonies which were found on piers and pilings in other areas of the Harbor. The extreme of this situation occurs along the expanse of Pier 41 where the dry dock Kapilipono is permanently moored flush against the pier, resulting in complete elimination of

conditions suitable for coral settlement and growth. The one area that represents an exception to the pattern is the small region at the end of the finger pier separating Piers 41 and 42. At this location, a small area is colonized by a larger, well developed coral structures. Observations of these corals, as well as all of the corals in the other regions of Sector H did not reveal the presence of coral disease. This observation is consistent with the results from inspection of the corals inhabiting the piers in the Kapalama Basin which were consistently free of coral disease.

Sincerely,

Steven Dollar, Ph.D

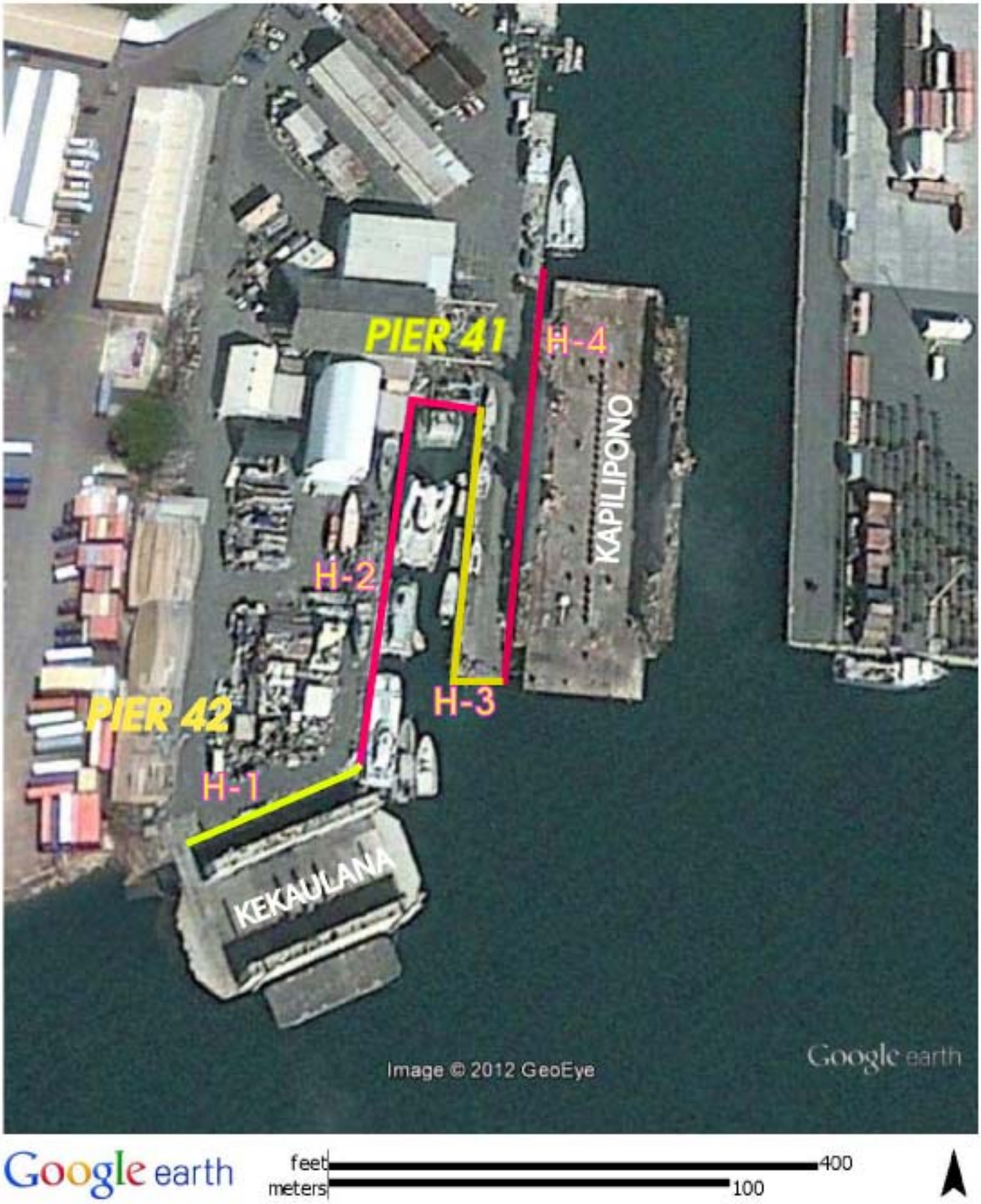

FIGURE 1. Aerial image of Piers 41 and 42 in Honolulu Harbor showing locations of Pacific Shipyards two floating dry-docks KeKaulana and Kapilipono. Yellow and red lines denotes sector H, and sub-sectors H-1, H-2, H-3 and H-4 used in marine assessment of Kapalama Basin.

TABLE 1. Counts of coral colonies according to size classes on survey sub-sectors of Sector H in Kapalama Basin. Only coral species occurring in each sector are shown for that sector. For location of sectors, see Figure 1.

SECTOR H-1	SIZE CLASS (cm)								
SPECIES	≤2	>2≤5	>5≤10	>10≤20	>20≤40	>40≤80	>80≤160	>160	TOTAL
Porites lobata		5	3	1	1				10
Pocillopora damicornis	31	28	26	16					101
Montipora capitata		1	2	1					4
Montipora patula			2	1					3
Leptastrea purpurea	2	3							5
Pavona varians				2	2				4
TOTAL	33	37	33	21	3	0	0	0	127

SECTOR H-2	SIZE CLASS (cm)								
SPECIES	≤2	>2≤5	>5≤10	>10≤20	>20≤40	>40≤80	>80≤160	>160	TOTAL
Porites lobata	15	53	12	2					82
Pocillopora damicornis	12	26							38
Montipora capitata			1						1
Montipora patula		2							2
Leptastrea purpurea	87	15							102
TOTAL	114	96	13	2	0	0	0	0	225

SECTOR H-3	SIZE CLASS (cm)								
SPECIES	≤2	>2≤5	>5≤10	>10≤20	>20≤40	>40≤80	>80≤160	>160	TOTAL
Porites lobata	76	64	37	10	11	12	2		212
Porites compressa						2			2
Pocillopora damicornis	12	6							18
Montipora capitata		2	4						6
Montipora patula		6	8	2					16
Leptastrea purpurea	21	23	3						47
TOTAL	109	101	52	12	11	14	2	0	301

SECTOR H-4	SIZE CLASS (cm)								
SPECIES	≤2	>2≤5	>5≤10	>10≤20	>20≤40	>40≤80	>80≤160	>160	TOTAL
Porites lobata									0
Pocillopora damicornis									0
Leptastrea purpurea									0
TOTAL	0	0	0	0	0	0	0	0	0

TABLE 2. Fish abundance and biomass in Sector H, Kapalama Basin, Honolulu Harbor.

Sub-Sector	Species	Abundance	Size (cm)	Biomass (g)
H-1	*Mulloidichthys flavolineatus*	1	20	85.2
	Canthecaster jactator	2	10	53.2
	Chaetodon lunula	1	10	29.5
	Chaetodon auriga	1	10	28.0
	Abudefduf abdominalis	20	8	176.4
	Zanclus cornutus	1	10	34.5
H-2	*Abudefduf abdominalis*	10	9	129.6
	Abudefduf vaigiensis	5	10	91.4
	Acanthurus blochii	9	15	1126.0
	Stegastes marginatus	1	15	99.9
	Chaetodon auriga	2	10	56.0
H-3	*Acanthurus blochii*	40	12	2481.3
	Chaetodon auriga	2	10	56.0
	Zebrasoma veliferum	1	10	24.9
	Abudefduf vaigiensis	12	10	219.5
	Naso lituratus	2	18	364.0
	Zebrasoma flavescens	1	8	12.9
H-4	*Chaetodon auriga*	4	12	191.9
	Acanthurus blochii	1	15	125.1
TOTAL		116		5385.4

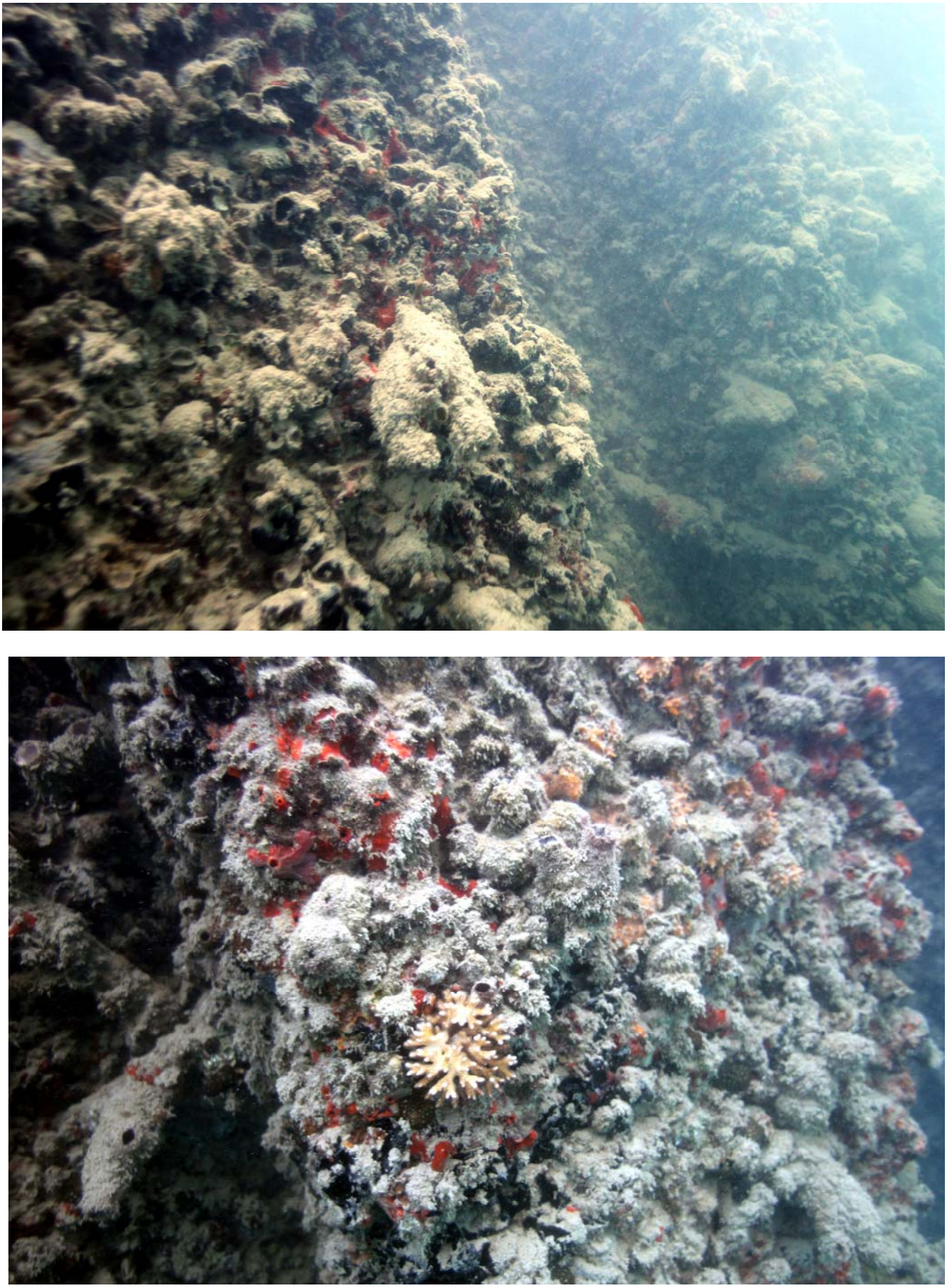

FIGURE 2. Two photos of sheet-piling wall of Pier 42 designated as Section H-1 in Figure 1 inshore of PSI dry-dock KeKaulana. Predominant corals in this section were small branching colonies of *Pocillopora damicornis* as seen in bottom photo.

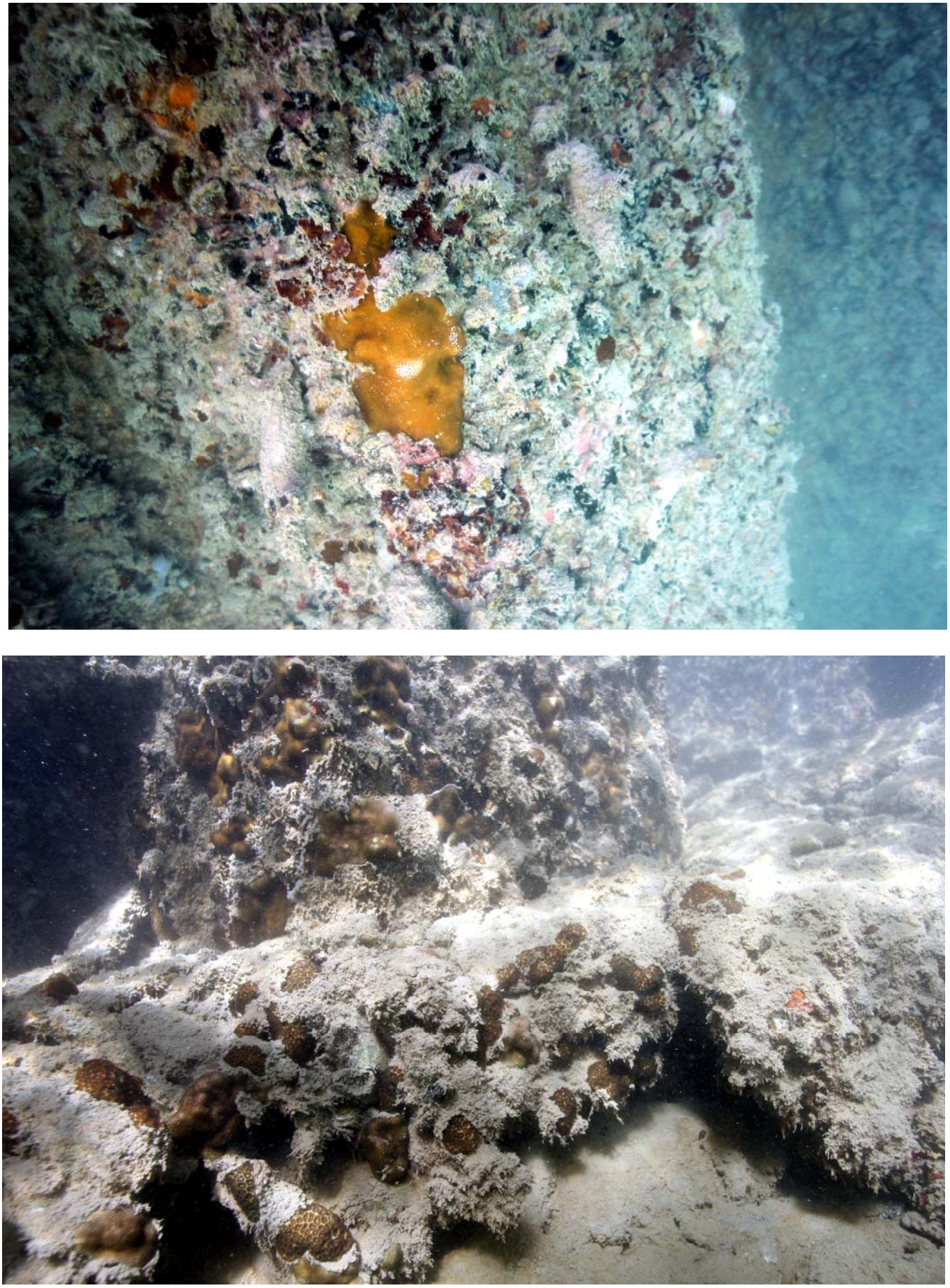

FIGURE 3. Two photos of sheet-piling wall of Pier 42 designated as Section H-2 in Figure 1 under moored commercial boats. Predominant corals in this section were small encrusting colonies of *Porites lobata* (top photo) *and Leptastrea purpurea* (bottom photo).

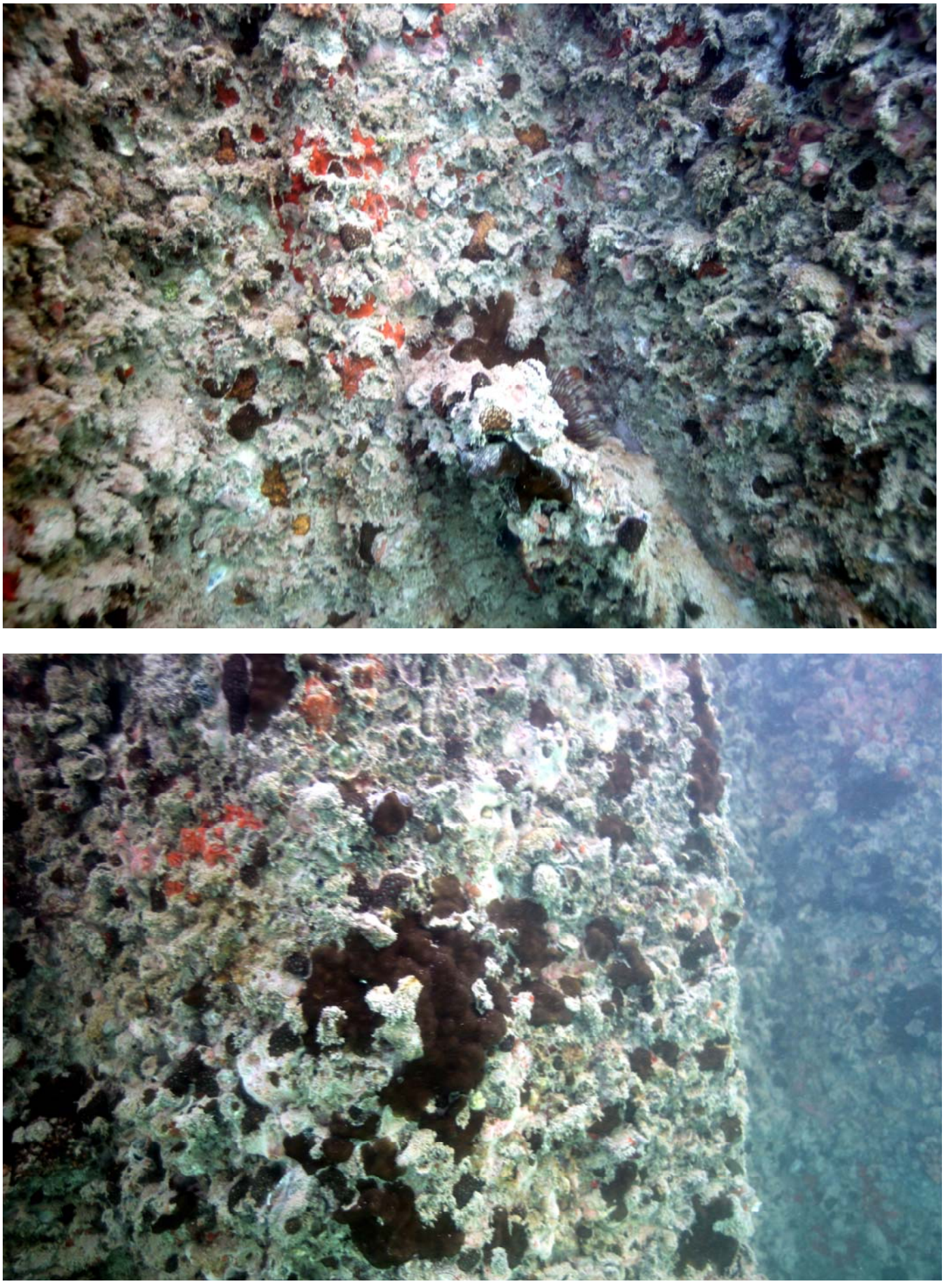

FIGURE 4. Two photos of sheet-piling wall of Pier 41 designated as Section H-3 in Figure 1 under moored commercial boats. Predominant corals in this section were small encrusting colonies of *Porites lobata* in both top and bottom photos.

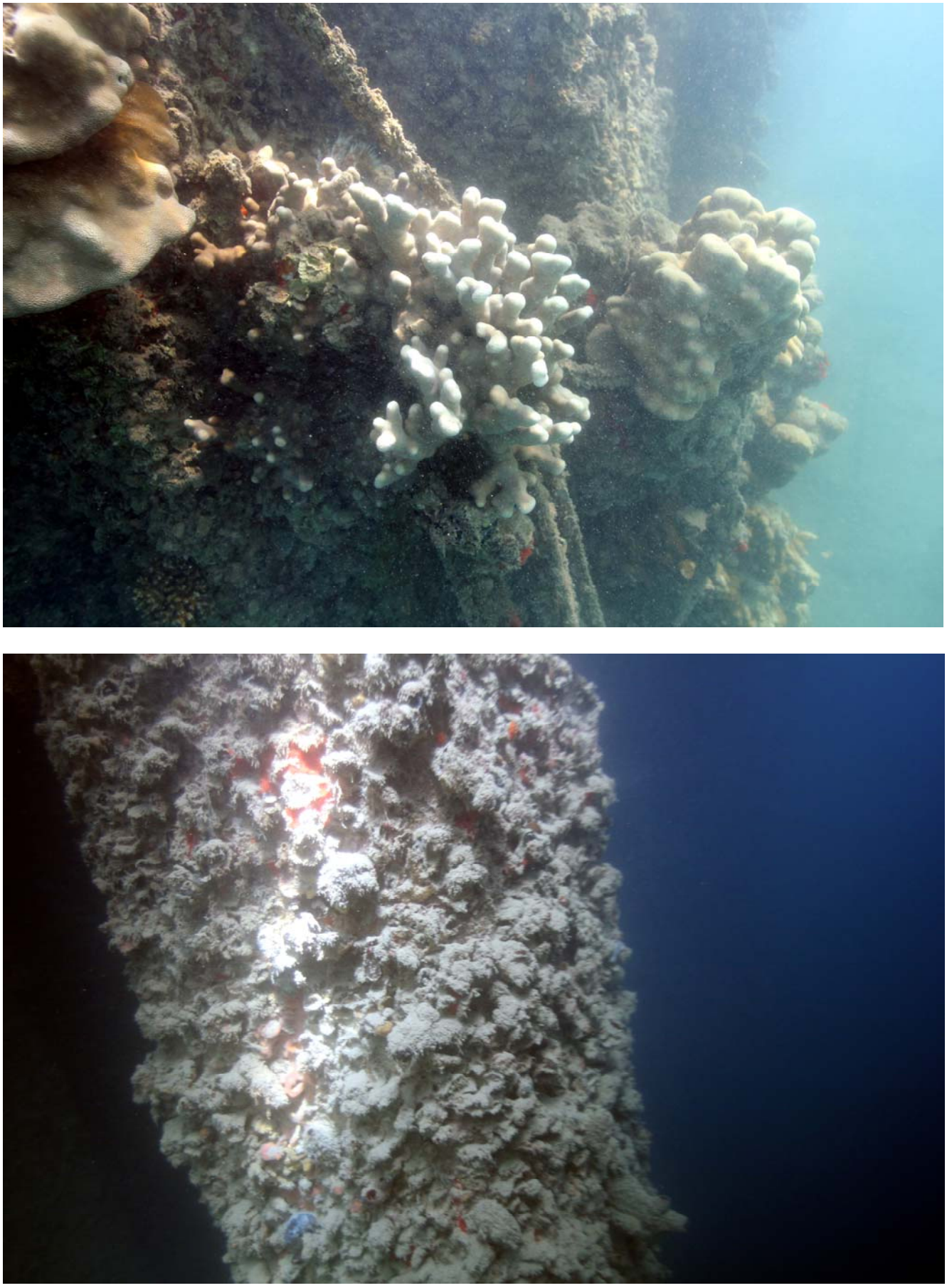

FIGURE 5. Top photo shows end of Pier 41 at juncture of sub-sections H-3 and H-4 in Figure 1 adjacent to PSI dry-dock Kapilipono. This was the only area of Section H with what can be considered large coral colonies of *Porites lobata* and *P. compressa*. Lower photo shows one of the pilings in sub-section H-4 under dry-dock that does not contain any coral colonization.