

### **A. Project Location**

Causeway Bay Typhoon Shelter is one of 14 typhoon shelters protecting Hong Kong and is located in Causeway Bay, between the Hong Kong Island entrance to Cross Harbour Tunnel on Kellett Island and Island Eastern Corridor. It is approximately 14 hectares (35 acres) in size. It is also the location of the main base of the Royal Hong Kong Yacht Club. The Causeway Shelter is open to the sea and is subject to tidal activity.

### **B. Pre-Treatment**

Prior to the treatment following problems were observed:

1. Murky waters
2. Disappearance of the fish population
3. Considerable grease deposits accumulating on the sides of the quays. The grease originated from the many restaurants in the area and from the discharge of raw sewage into the Bay.
4. Strong odours caused by the anaerobic fermentation of the sludge at the bottom of the Bay. The odour had the characteristic rotten egg smell of hydrogen sulphide.

### **C. Treatment**

To positively impact on water quality in the shelter, Bio4Aqua:Lagoon was applied directly to the surface of the waters in the following areas:

1. Western corner of the Shelter: Bio4Aqua:Lagoon at a rate of 1 metric ton per hectare.
2. West Nullah area: Bio4Aqua:Lagoon at a rate of 100 grams per m<sup>2</sup>

To reduce the volume of grease already accumulated in the shelter and reduce the potential for an increase in that accumulation, two proprietary BactiDomus® Technology products were applied directly to the sewers draining into the shelter.

### **C. Post-Treatment Results**

1. Odour: The strong hydrogen sulphide odours had for the most part disappeared after 6 weeks. In its place a slight grease odour was observed in certain isolated locations.



## PROJECT REVIEW – CAUSEWAY BAY TYPHOON SHELTER HONG KONG

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2. Grease accumulation: A gradual decrease of the grease accumulated on the walls and stairs leading to the Bay is observed. It is replaced by the re-appearance of algae on the clean segments of the walls and the stairs. Members of the Royal Yacht Club also observed a reduction in accumulation of grease on the hulls of the boats.

It is important to note that these decreases in grease occurred without any change to the volume of grease and oil discharged into the Bay from restaurants and/or private dwellings.

C. Aquatic animal life: A significant increase in both the variety of species and actual number of fish and fish fry was observed in the shelter waters. Barnacles and mussels begin to re-colonize the walls and the stairs of the quays and barnacles re-appear on boat hulls at the Royal Yacht Club.

D. Water quality: The water clarity improved to a depth of 1.5 to 2 meters.

Ammonia nitrogen (N-NH<sub>3</sub>) at one meter depth decrease 58 percent from 1.72 mg/l to 0.7 mg/l.

The soluble phosphor levels at one meter depth decrease 65 percent from 0.8 mg/l to 0.28 mg/l.



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