

LOCAL VESSELS ADVISORY COMMITTEE

**Provision of Concrete Pontoon Floating Barriers
at Hei Ling Chau Typhoon Shelter**

Purpose

Members are invited to refer to the Annex for perusal of a paper concerning the captioned matter, and submit any comments on the paper by replying to the Secretariat on or before 29 October 2021.

Marine Department

15 October 2021

**Provision of Concrete Pontoon Floating Barrier
at Hei Ling Chau Typhoon Shelter**

Purpose

Members are invited to note the details and seek member's comments on the preliminary arrangement of the pilot project of concrete pontoon floating barriers at the Hei Ling Chau Typhoon Shelter (HLCTS) as set out in this information paper.

Background

2. HLCTS is surrounded by hills of Hei Ling Chau, Cheung Chau and Lantau Island. It has a large sheltered space while it is relatively more exposed to wind and wave from south-east direction and south-west direction therein (see **Annex A**).

3. The Marine Department (MD) has entrusted the Civil Engineering and Development Department (CEDD) to assess the wave conditions within HLCTS under extreme conditions and propose implement the enhancement measures. The rubble mound breakwaters at the entrance of HLCTS could largely shelter the exposed wave from entering into the typhoon shelter. HLCTS could provide about 76.6 hectares sheltered spaces. Local wind-generated wave will be induced within HLCTS under extreme weather conditions.

4. Concrete pontoon floating barriers are made of precast units and its installation is relatively simple, and effective in withholding waves of moderate amplitudes and short wave period. In considering the enhancement proposal for utilization inside HLCTS under extreme weather, CEDD recommended to explore deployment of concrete pontoon floating barriers to attenuate the local wind-generated wave within HLCTS, taking into account its simple installation method and cost effectiveness.

5. The significant wave height ¹ and wave period of local waves induced by extreme weather related wind within HLCTS generally fulfils recommended working ranges for the floating barriers. With reference to technical information in relevant literature and manufacturer's catalogue, in general, the aforesaid floating barriers are effective for short wave period and the transmission of waves could be generally reduced up to 30% after passing floating barrier. It helps reduce motions of moored vessels against damage under extreme conditions, particularly small vessels. Typical section of concrete pontoon floating barriers is illustrated in **Annex B**.

Pilot Project of Concrete Pontoon Floating Barrier

6. In view of small vessels are more susceptible to wave under extreme weather conditions, we suggest to conduct a pilot project to install floating barriers to assess the wave attenuation performance of the floating barriers at the existing private mooring areas of HLCTS. In the preliminary arrangement, two rows of concrete pontoon floating barriers along east-west direction (approximately 5 metres wide x 300 metres long in each) and one row of concrete pontoon floating barriers along north-south direction (approximately 4 metres wide x 100 metres long) are required for wave attenuation of local wind-generated wave under south-east and south-west wind directions respectively. The schematic layout of the pilot project is presented in **Annex C**. Wave attenuation performance of the floating barrier will be monitored during typhoon seasons (i.e. May to November).

Advice Sought

7. Members are invited to comment on the above proposal on or before 29 October 2021. For enquiries, please contact Mr. Raymond YUEN of CEDD by telephone at 2762 5627 or by email at rwmyuen@cedd.gov.hk; or contact Secretary of Local Vessels Advisory Committee (LVAC) by committee_unit@mardep.gov.hk.

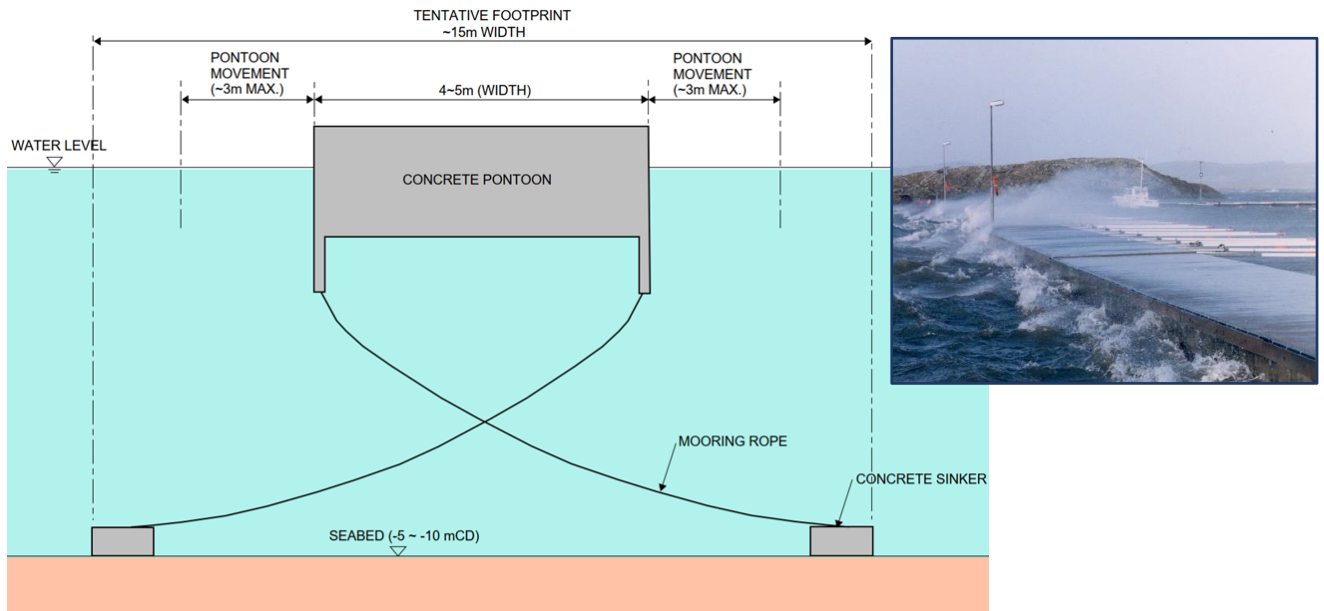
Civil Engineering and Development Department October 2021

¹ Significant wave height (H_s), which is defined as average height of the highest one-third of waves, is well recognized in the coastal engineering field internationally for design and assessment. Waves higher than H_s are possible in real-world situation.

Location of HLCTS



Typical Section of Concrete Pontoon Floating Barrier



PRELIMINARY TYPICAL SECTION
(NOT TO SCALE)
dimensions subject to future
detailed structural and mooring design

Location and Schematic Layout of Pilot Project

