LVAC Paper No. 1/2023

LOCAL VESSELS ADVISORY COMMITTEE

Deployment of Temporary Wave Monitoring Station at Hei Ling Chau Typhoon Shelter

Purpose

Members are invited to note the Annex containing a paper issued by the Civil Engineering and Development Department concerning the captioned matter.

Marine Department
1 February 2023

Annex

Deployment of Temporary Wave Monitoring Station at Hei Ling Chau Typhoon Shelter

Purpose

Members are invited to note the details of the deployment of two temporary wave monitoring stations at 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 **Appendix A**).

3. The Marine Department has entrusted the Civil Engineering and Development Department (CEDD) to assess the wave conditions within HLCTS under extreme conditions and implement the improvement measures to suppress the wind-generated wave within the typhoon shelter as much as possible. The improvement works is to install concrete pontoon floating barriers to attenuate the local wind-generated wave at suitable area in HLCTS as a pilot project to assess their wave attenuation performance. 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 (**Appendix B**). The Local Vessels Advisory Committee was consulted on 15 October 2021 for the proposed works (Paper No. 19/2021) and no comment was received. The project commenced in January 2022 for completion in the first quarter of 2023.

4. The CEDD propose to install two temporary Acoustic Doppler Current Profiler (ADCP) sensors to measure the wave attenuation performance of the floating barriers under calm and stormy weather conditions within HLCTS.

The performance monitoring is proposed to be conducted for 12 months after completion of installation of the concrete pontoon floating barriers, tentatively from Q2 2023 to Q1 2024.

Proposal

5. The CEDD proposes to set-up 2 temporary wave monitoring stations at HLCTS. The wave monitoring station comprises two main components including an ADCP deployed on the sea-bed for measurement of wave and current data, and a marker buoy. The proposed location and the schematic diagram of the wave monitoring station are shown in **Appendices B and C**.

6. The proposed ADCP will be installed in a Trawl Resistance Bottom Mount (TRBM) with height of about 0.5m and sufficient weight for stable deployment on the seabed. The TRBM will be deployed on the sea-bed (about -5mCD) within HLCTS for measurement of wave and current data. Yellow marker buoys fitted with yellow flashing lights will be laid to mark the positions. A diving rope will be used to connect the marker buoy to the TRBM. Vessels navigating in the vicinity shall keep safe clearance with the relevant maker buoys.

7. Regular maintenance service (usually once every 3 months) will be provided by the contractor including data collection, cleansing of equipment and replacement of batteries, etc. During routine maintenance, if any chemicals would be used (i.e. antifouling paints), it will be stored and disposed of properly. The position of the mark buoy will be monitored by satellite positioning device in the buoy. Upon completion of the 12 months monitoring, the performance records will be used to assess the wave attenuation performance of floating barriers.

Way Forward

8. Members are invited to note the details described in paragraphs 5 to 7 above.

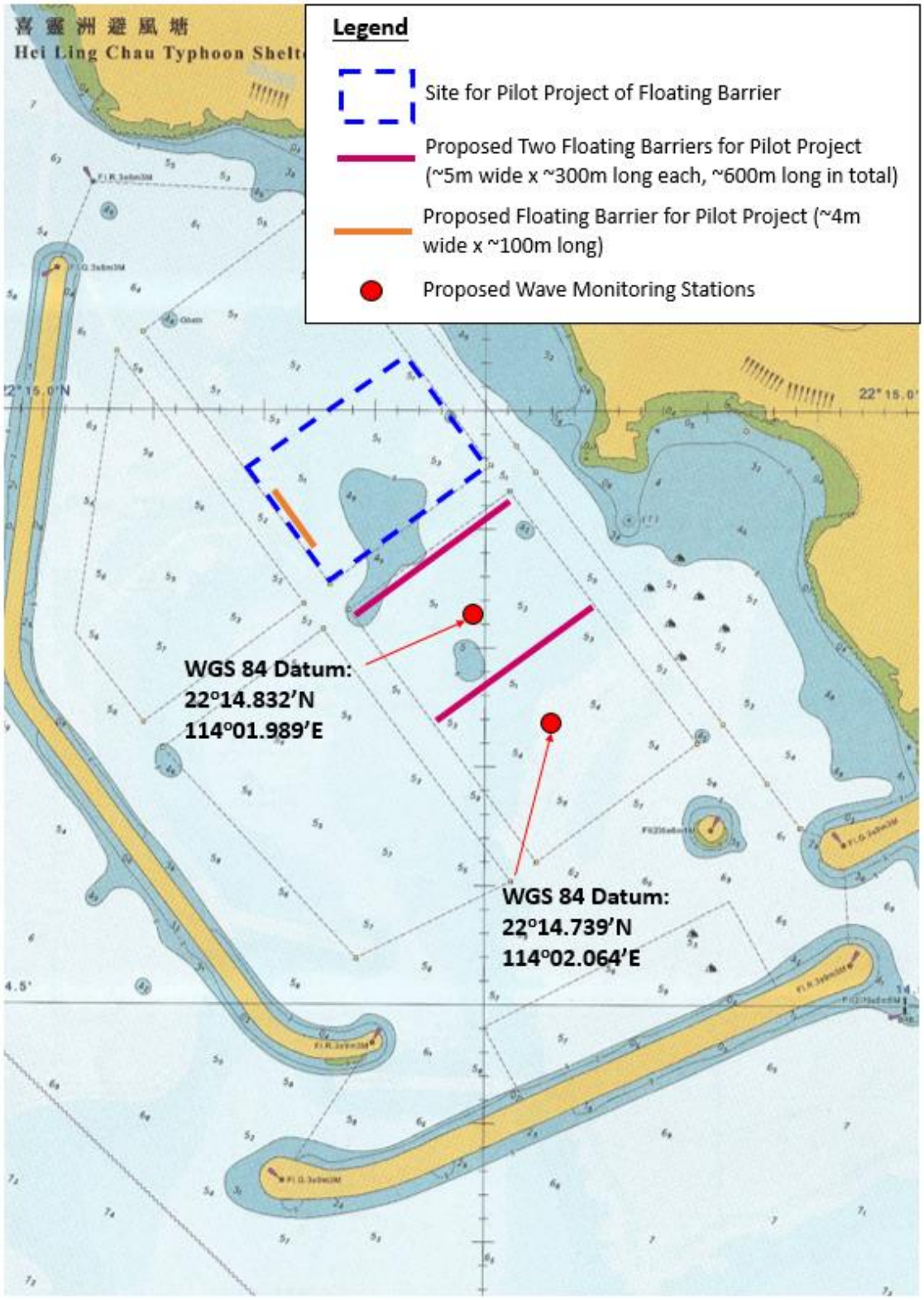
Port Works Division
Civil Engineering and Development Department
February 2023

Appendix A

Location of HLCTS

Appendix B

Location and Schematic Layout of Pilot Project

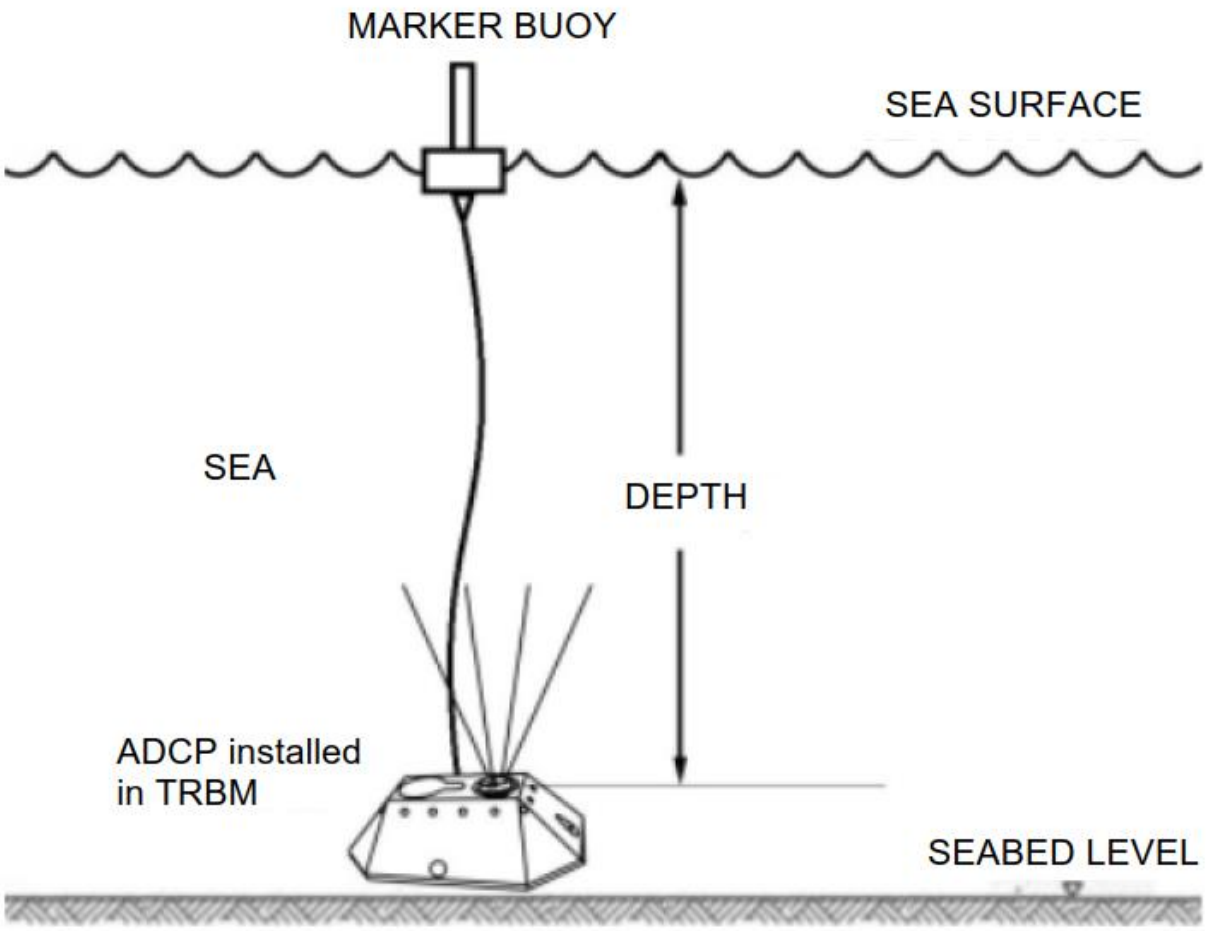


Position (WGS 84 Datum)

- 22°14.832'N 114°01.989'E
- 22°14.739'N 114°02.064'E

Appendix C

Schematic Diagram of Wave Monitoring Station



Proposed arrangement of TRBM and mark buoy connected with diver rope

Proposed type of marker buoy to be deployed