

LOCAL VESSELS ADVISORY COMMITTEE

**Pilot Deployment of Real-time Wave Monitoring Station
to the South of Hong Kong Island Waters**

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
5 November 2021

**Pilot Deployment of Real-time Wave Monitoring Station
to the South of Hong Kong Island Waters**

Purpose

Members are invited to note the details of the pilot deployment of a real-time wave monitoring station to the south of Hong Kong Island waters as set out in this information paper.

Background

2. To enhance the government's capability in wave monitoring system in Hong Kong waters, Civil Engineering and Development Department (CEDD) plans to install a water monitoring station to the south of Hong Kong Island waters to monitor the hydrodynamic conditions there, from which valuable reference information can be obtained to better understand how waves behave in calm and stormy weather conditions within Hong Kong to cope with the challenges of extreme weather due to climate change and the pace of infrastructural development in Hong Kong waters.

Proposal

3. CEDD will launch the scheme tentatively in the first quarter of 2022 to deploy a real-time wave monitoring station mounted inside a new tailor-made Trawl Resistance Bottom Mount (TRBM) with height of about 0.5m to the south of Hong Kong Island waters for measuring wave (including spectral significant wave height, maximum recorded wave height, peak wave period, zero crossing wave period, mean wave direction and average water depth). Data obtained from the system will be used to provide important information for planning and design of marine structures/works which are crucial to protect lives and properties.

4. The proposed real-time wave monitoring station in the form of underwater bottom mount will be placed at 22°11.557' N 114°13.045' E, which is about 200m from the shoreline of Bluff Head of Hong Kong Island South and about 250m away from the nearest submarine cables. The proposed location and the schematic diagram of the real-time wave monitoring station are shown in **Appendices A and B**.

5. The proposed real-time wave monitoring station comprises three main components including an Acoustic Doppler Current Profiler (ADCP) deployed on the sea-bed for measurement of wave and current data, a special mark buoy with a modem for transmission of wave and current data, and an office server for storage of wave and current data. The system is self-contained and running automatically to conduct real-time monitoring of hydrodynamic conditions. No discharge will be generated during the operation of monitoring system as the analyses will be carried out acoustically and optically with no chemical reaction involved. The performance of the ADCP will be closely monitored via remote terminals. During the early phase of deployment, more frequent inspections (up to once per week) may be arranged if necessary. Afterwards, routine maintenance needs to be conducted on a quarterly basis.

6. The special mark buoy is designed with a diameter of 3m and focal height of 5.16m (**Appendix C**). Safety features include lights, top mark, signs, radar reflector and automatic identification system. The special mark buoy will be equipped with a modem, internal batteries and solar panels. The special mark buoy is designed in compliance with the specifications and requirements of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Guideline No. 1099 on the Hydrostatic design of buoys (Edition 1 May 2013) published by the IALA. According to the Navguide 2018 Marine Aids to Navigation Manual (8th Edition) published by the IALA, the minimum length of mooring chain should be two times of the water depth. For the water depth of about 25m, an about 50m long single mooring chain will be connected to one 20 tonnes concrete block sinker for anchoring the special mark buoy. The particulars of the special mark buoy are as follows:

Name	: CEDD-HKI
Position (WGS 84 Datum)	: 22°11.557' N 114°13.045' E
Shape	: Pillar
Colour	: Yellow
Light Characteristics	: Fl (5)Y.20s
Top Mark	: Yellow “X”
Radar Reflector	: Fitted
Automatic Identification System	: Fitted

7. The position of the scientific buoy will be monitored by on-board GPS device in real time. For any drift of the buoy more than 60m from its original position, the contractor will perform inspection and relocate the buoy back to its original position within 1 day if the weather allows.

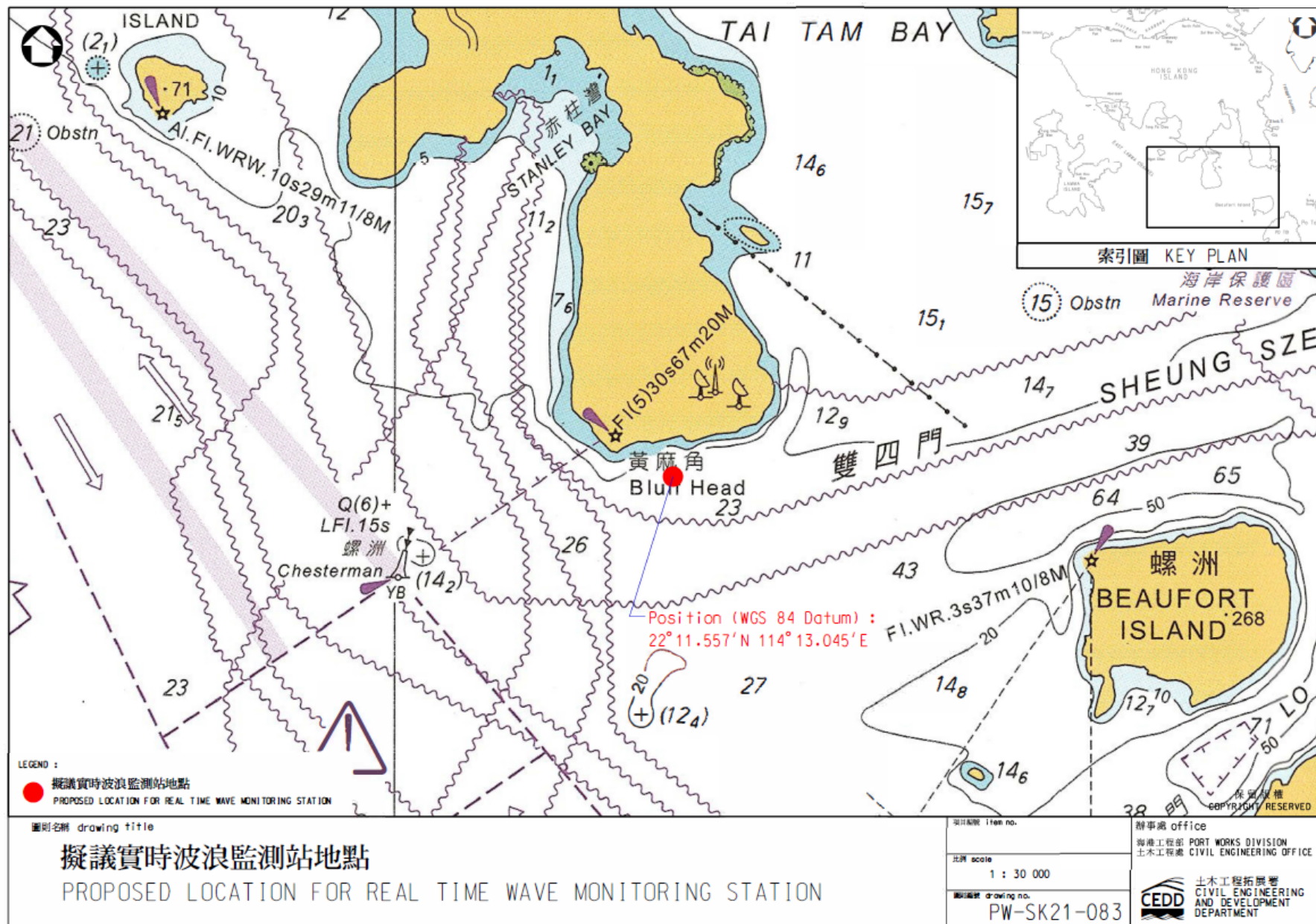
8. Upon completion of the 1-year trial run, it is proposed that the real-time wave monitoring station will continuously be deployed at the south Hong Kong Island waters for measurement of wave and current.

Way Forward

9. CEDD will liaise with the Marine Department for the installation of the special mark buoy to the south of Hong Kong Island waters.

10. Members are invited to note the details of the proposal described in paragraphs 3 to 8 above. In case of any enquiry on the related matters, please contact Mr. WONG Hiu-dan of CEDD by phone at 2762 5553, or by email: hdwong@cedd.gov.hk.

**Port Works Division
Civil Engineering and Development Department
November 2021**



Appendix B - Schematic Diagram of Real-time
Wave Monitoring Station

附錄B - 實時波浪監測站示意圖

