

Settlement Monitoring in Hong Kong Port (HKP)

- **Project** : HK Airport Authority

- **Contractor**

Phase 1 : Shun Yuen Construction Ltd
Phase 2: Wing Hing Construction Ltd

- **Monitoring Starting Date**

1 Feb, 2024

- **Location**

Hong Kong-Zhuhai-Macao Bridge (HZMB)
Hong Kong Port



- **Objective**

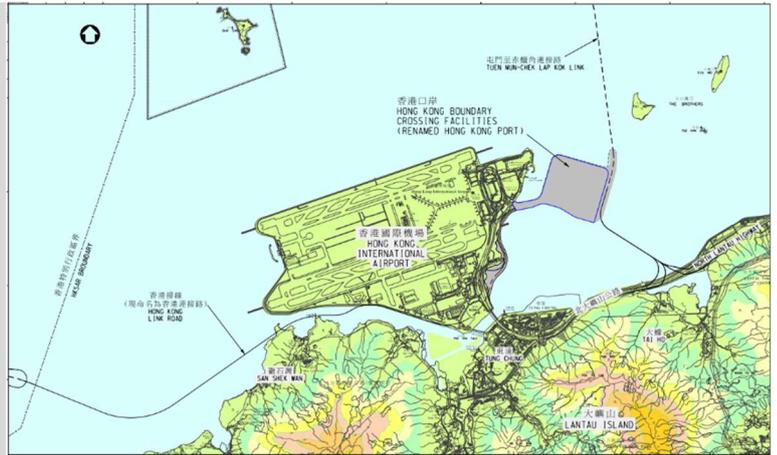
Settlement monitoring for HK Port

- **Tools**

Happy Monitoring with GNSS
SMOS Webportal



Happy GNSS



Background

The Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong Port is a ~150-hectare reclaimed artificial island located northeast of Hong Kong International Airport. Operational since October 24, 2018, it serves as a major boundary crossing facility (BCF) with passenger and cargo clearance, connecting Hong Kong to the bridge via the Tuen Mun-Chek Lap Kok Link.

In order to ensure structural integrity and safety, continuous monitoring of the settlement of Hong Kong Port (HKP) is necessary.

Site Work

Phase 1 : 5 Happy GNSS Rovers with solar panels were installed in the southern part of artificial island to monitor the settlement of the island. A GNSS base was setup in stable area in Chek Lap Kok which was outside the artificial island. Happy monitoring system started in Feb 2024.

Phase 2 : 5 Happy GNSS Rovers with solar panels were installed in the eastern part of artificial island and were added into the Happy monitoring system in Dec 2024.



Challenge

- Signal Interference from nearby Airport may create some noise to GNSS receiver.
- Power to support GNSS 7*24 operation.

Technology

Happy GNSS Sensors support multiple satellite constellation including GPS, GLONASS, BEIDOU, GALILEO, QZSS, SBAS and IRNSS. If one frequency is jammed or interfered with, the system can rely on others to maintain a stable fix. Happy GNSS are integrated with GPRS which can get corrections from HAPPY BASE for maximum accuracy. Thanks to the new build-in interference rejection and multipath mitigation algorithms, Happy GNSS can achieve a more stable and reliable signal. An interference-free IMU allows precise monitoring of tilt and inclination. Settlement Trend can be viewed in SMOS webportal with hourly, daily and monthly chart. If settlement is exceeded the alert limit, Email alert message will be sent automatically.

