ANNEX D: FACTSHEET ON BCA-GAMMON'S 5G TRIAL AT SENTOSA

Background

As part of the government's 5G trials, the Building and Construction Authority (BCA) has been collaborating with Gammon, builder of the North-South Link Project in Sentosa, to identify and trial possible use cases for a 5G-enabled smart construction site.

5G Use Cases

1. Autonomous Robots with 3D Laser Scanners

Today, it is difficult to check complex forms of a building to ensure it is built according to the intended design. A 3D laser scan is a recent approach to ensure that the completed structure is built according to the design model. However, this process is resource intensive and time consuming as the scanning is done manually. More importantly, owning to huge size of the scanned data, online remote verification of the as-built forms against the design profile is not possible.

With 5G technology, builders can now use fully autonomous robots with mounted 3D laser scanners to do a live-streamed remote scanning of the completed works seamlessly. This can also be applied for off-site progress tracking and quality control checking of the construction project.

2. Mixed Reality Technology

Mixed Reality (MR) technology allows a user to visualise and guide the installation works by overlaying a digital model virtually on actual physical worksite through a wearable head mounted display (HMD).The overlay allows the user to achieve geometry alignments during installation. This operation requires very low latency and high bandwidth which current 4G networks are not suited for.

The increased bandwidth and low latency of a 5G network will help mitigate such issues and allow MR users to obtain real-time inputs from the cloud server into HMDs, thus allowing for a smoother site inspection experience.

3. Video Capable Drones

Drones equipped with video cameras are useful tools to capture video data and images for offline processing needs. Compared to using 4G networks, 5G technology can better support a smoother and stable drone flights for live streaming video feeds from the drone to the server. It will also allow drones to be flown remotely beyond line of sight, opening many possibilities for site inspection.

The 5G Use Cases
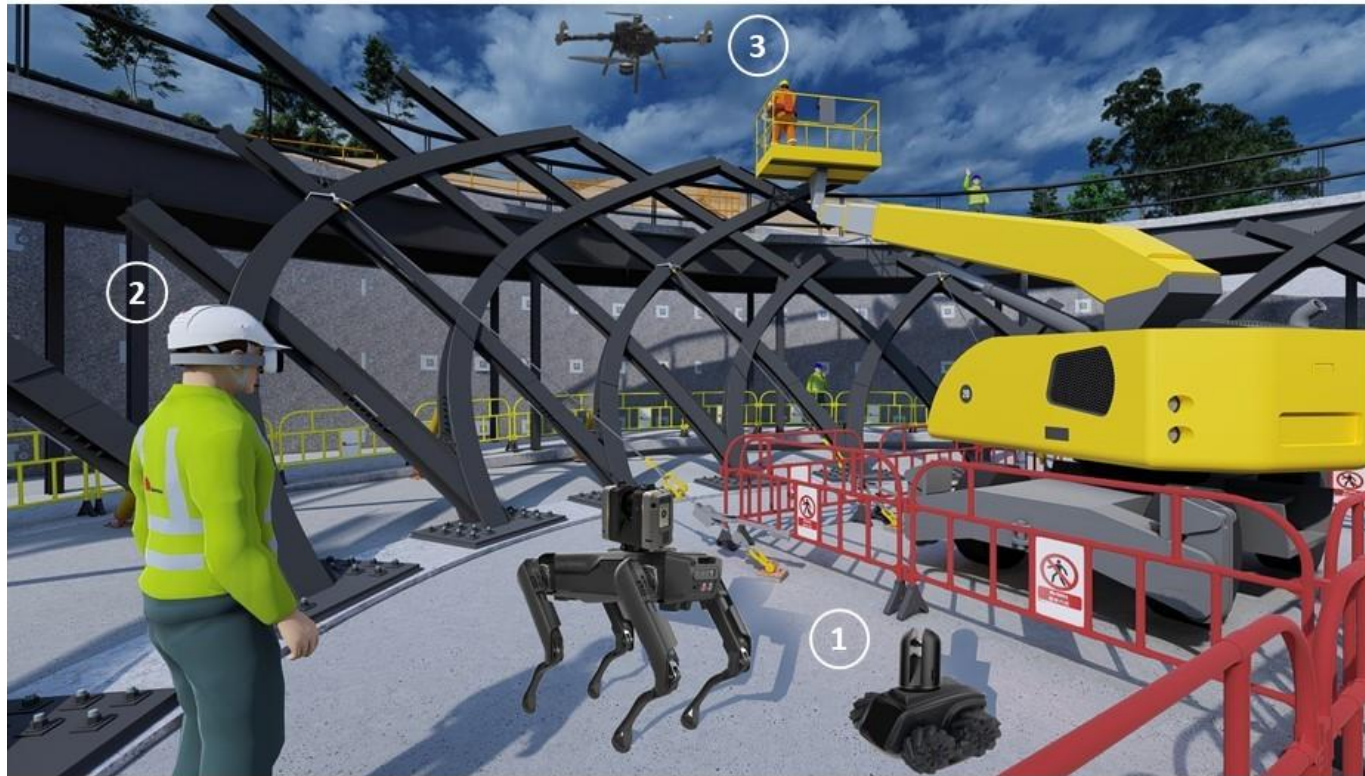
1. As-built verification using robots

2. Geometry & alignment checks using MR Technology

3. Site inspections using drones