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**Proposed Implementation of Smart Site Safety System (SSSS)  
for Private Development Projects**

**Introduction**

The Government has been promoting the wider adoption of advanced technology and innovation in the construction industry for enhancing site safety. The industry is strongly encouraged to adopt Smart Site Safety System (SSSS) for use in construction sites to uplift site safety performance. Technical Circular (Works) No. 3/2023 was issued by the Works Branch of the Development Bureau on 27 February 2023 promulgating the adoption of SSSS in public works projects with a contract sum exceeding \$30 million. In parallel, the Buildings Department (BD) issued a circular letter on 30 March 2023 to appeal to authorized persons, registered structural engineers, registered geotechnical engineers, registered inspectors and registered contractors (RC) to adopt SSSS in their projects to uplift site safety.

2. SSSS generally comprises three components, namely smart safety devices for monitoring activities and identifying safety hazards; a communication network for transmitting data collected from smart safety devices; and a centralised management platform for providing a one-stop hub for data analysis and alerts generation, as well as facilitating follow-up actions. The system enables the project team to grasp the safety situation of the entire construction site by collecting and transferring real-time data to a centralised management platform. Whenever a potential hazard is detected, the system will immediately alert the safety management staff and workers on site. Suitable items of smart safety devices include:

- (a) Digitised tracking system for site plants, powered tools and ladders;
- (b) Digitalised permit-to-work system for high risk activities;
- (c) Hazardous areas access control by electronic lock and key system;

- (d) Unsafe acts / dangerous situation alert system for mobile plant<sup>1</sup> operation danger zone (Mobile Plant Alert System<sup>2</sup>);
- (e) Unsafe acts / dangerous situation alert system for tower crane lifting zone (Tower Crane Alert System<sup>3</sup>);
- (f) Smart monitoring devices for workers and frontline site personnel;
- (g) Safety monitoring system using artificial intelligence;
- (h) Confined space monitoring system; and
- (i) Safety training with virtual reality technology.

3. Reference materials on SSSS are provided in the “Guide to Smart Safety-Related Technologies for Use in Construction Works”<sup>4</sup> issued by the Construction Industry Council.

### **Proposed Implementation of SSSS**

4. Section 17 of the Buildings Ordinance (BO) provides that the Buildings Authority (BA) may impose conditions and requirements when granting approval of plans or consent to commencement of building works. Under item 6(e) of section 17(1) of the BO, the BA may require and prescribe

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<sup>1</sup> “Mobile plant” generally includes all mobile plants but not limited to excavators, crawler cranes and mobile cranes.

<sup>2</sup> The system will alert the mobile plant operator and any site personnel encroaching the mobile plant danger zone perimeter of the risk of being run over or hit by the plant moving components. The automated warning system shall include adequate number of sensors installed on the mobile plant chassis and movable superstructures to ensure full 360° coverage around the mobile plant danger zone perimeter. The danger zones of the mobile plant operation shall be determined by Safety Officer according to risk assessment but in no case shall the extent of the danger zone be less than 2m from any part of the mobile plant.

<sup>3</sup> The system will alert tower crane operator and any site personnel encroaching upon the tower crane loading/unloading danger zone perimeter of the risk of being hit by the moving load under the crane hook. The automated warning system shall include adequate number of sensors installed on or around the tower crane to ensure full coverage of all loading/unloading areas danger zone perimeter at all floor levels involved. The loading/unloading danger zones of the tower crane operation shall be determined by Safety Officer according to risk assessment but in no case shall the extent of the danger zone be less than 7m radius from the crane hook. The minimum clearance between cargo being lifted and the loading/unloading area activating the automatic warning system shall be determined by Safety Officer according to risk assessment but in no case be less than 3m.

<sup>4</sup> [https://www.cic.hk/eng/main/aboutcic/publications/reference\\_materials/](https://www.cic.hk/eng/main/aboutcic/publications/reference_materials/)

conditions for, among others, qualified supervision for building works.

5. Smart safety devices in paragraph 2(d) and (e) above (i.e. Mobile Plant Alert System and Tower Crane Alert System) are measures aiming to control hazards arising from building works which fall within the scope of site safety management and supervision under the BO. To enhance safety of building works, the BA will impose a condition under item 6(e) of section 17(1) of the BO and upon granting first approval of superstructure plans, requiring the adoption of these two smart safety systems for development projects with an estimated construction cost exceeding \$30 million<sup>5</sup>. Implementation of these two systems for mobile plants and tower cranes when carrying out building works on site will therefore be required upon commencement of superstructure works.

6. It is proposed that the requirements in paragraph 5 above will be applicable to all development projects with **first** approval of superstructure plans to be granted **on or after 1 July 2024**.

### **Advice Sought**

7. Members' comments on the proposed implementation of SSSS for private development projects as detailed in paragraphs 4 to 6 above are welcome.

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**Buildings Department  
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<sup>5</sup> The project authorized person is required to declare the estimated construction cost upon applying for first superstructure consent.