CIC R&D Fund – Research Agenda 2023

Research Areas	Agenda

Construction Safety	- Development of **Smart Site Management System for SMEs** to enhance project performance on safety and productivity. Such system shall include, but not limited to, the following features:
	   i) Centralized Management Platform;
	   ii) Digitized Tracing System for Site Plants, Powered Tools and Ladders;
	   iii) Digitized Permit-to-work System for High Risk Activities;
	   iv) Hazardous Areas Access Control by Electronic Lock and Key System;
	   v) Unsafe Acts/ Dangerous Situation Alert System for Mobile Plant Operation Danger Zone;
	   vi) Unsafe Acts/ Dangerous Situation Alert System for Tower Crane Lifting Zone;
	   vii) Smart Monitoring Devices for Workers and Frontline Site Personnel;
	   viii) Safety Monitoring System Using Artificial Intelligence;
	   ix) Confined Space Monitoring System; and
	   x) Safety Training with Virtual Reality Technology.
	
	- Development of **High-mast Equipment / Machine Inspection Solutions** to inspect and monitor the status / condition of high-mast equipment/machine remotely and hence eliminate worker exposure to working at height hazards

Building Information Modelling	- Development of **BIM-enabled Design for Safety Solution** to simulate the major construction activities across the construction phase, identifying and mitigating the risk and implement it in the design - Development of **Scan-to-BIM Solution** to automatically convert point cloud data to BIM model for MEP works
Construction Productivity	- Development of **Robotic Solution for Drainage / Pipe Inspection** to inspect and identify the crack / block in drainage / pipe - Development of **AI-based Smart Defect Inspection System** to carry out quality inspection in accordance with the contract requirements/specifications and provide tracking records in a centralised system

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Research Areas	Agenda
	- Development of **AI-based Progress Tracking System** for building E&M works - Development of **AI-based Real-time Construction Progress Monitoring System** to automatically track the site progress and validate specific works completion rate - Development of **Underground Utilities/Infrastructure Detection and Visualisation Solutions** to map and visualize the underground infrastructure/utilities (e.g. pipelines or cables) before excavation works - Development of **Facade Water Leakage Detection Solution** to detect and track the leakage position
Green Construction	- Development of **Construction & Demolition (C&D) Materials Sorting Solution** to sort C&D waste by using robotic and / or AI camera solution in a congested construction site