

Construction Industry Council

Committee on Productivity

Meeting No. 004/23 of the Committee on Productivity was held on 13 Dec 2023 (Wednesday) at 2:30 pm in the Board Room, 38/F, COS Centre, 56 Tsun Yip Street, Kwun Tong, Kowloon and via MS Teams.

Present:	Ricky LEUNG	(RyL)	Chairperson
	CHUNG Kwok-fai	(CKFi)	
	Victor CHEUNG	(VC)	
	KAN Jun	(KJ)	
	Clarence LEUNG*	(CLWK)	
	Simon LIU	(SiL)	
	Joseph LO*	(JhL)	for Permanent Secretary for Development (Works)
	Rocky POON	(LKP)	
	Derek SO	(KLS)	
	Edwin TONG	(ETg)	
	Terence HUI	(TeH)	
	Franki YEUNG*	(FY)	
	Dominic LAW*	(DcL)	
	Rayson WONG*	(RnWg)	for Permanent Secretary for Housing (Housing)
In Attendance:	Albert CHENG	(CTN)	Executive Director – CIC
	Alex HO	(AHKK)	Director – Industry Development
	Yan ZHOU	(YZ)	Assistant Director – Industry Development
	Kenneth WU	(KKCW)	Senior Manager – Industry Development
	Zoe LAM	(ZeL)	Manager – Industry Development
	William WONG	(WW)	Manager – Industry Development
	Christy KWONG	(CyK)	Senior Officer – Industry Development
	Florence LAM	(FL)	Senior Officer II –Industry Development
Apologies:	LI Tat-wai	(LTWi)	
	Stephen LAI	(SnL)	
	Simon Wong	(SnW)	
	David MOW	(THM)	

* Members and presenters attended the meeting online via MS Teams.

MINUTES

Action

4.1 Confirmation of the Minutes of the Previous Meeting

Members confirmed the minutes of the Com-PRO Meeting No. 003/23 without further amendment.

All to Note

4.2 Matters Arising from the Previous Meeting

All to Note

a. Item 3.9a: Construction Industry Council (CIC) Research and Technology Development (R&D) Forum 2023

The CIC R&D Forum 2023 was held on 13 October 2023 (Friday). The theme was concerned of using concrete sensor in construction projects. Over 1100 attendees joined the forum in hybrid format.

b. 2023 CIC R&D Fund Proposals Summary

35 R&D applications were received in 2023 and 6 proposals were shortlisted for further approval. Members suggested exploring the feasibility of revising the current R&D schedule. The Secretariat took note of it and would follow up.

4.3 Report Key Performance Indicators (KPIs) status of Com-PRO 2023 & 2024

CIC Secretariat

The Secretariat reported the status of Com-PRO KPIs of 2023 and 2024 respectively.

Com-PRO KPI 2023:

a. Establish a Digital Resource Centre with Object Library (Please refer to Agenda item 4.6)

b. Establish or revamp manpower forecast model for professionals, technicians, and site supervisory personnel (SSPs)

The Secretariat had completed the final drafted forecast model and kept liaising with Development Bureau (DevB) The tentative publication to public would be Q2 2024.

c. Consultancy Study on “Digitalising Construction for Enhancing Project Delivery”

Draft best practice report with self-assessment form system would be ready for Members’ review and comments.

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- d. **Other than MiC and MiMEP, identification of 10 solutions that can have significant gain in construction productivity (Please refer to Agenda item 4.4)**
- e. **Track the strategies and actions recommendation in the TCQ Report**
The Secretariat would keep following up the update of strategies and actions.

Com-PRO KPI 2024:

- a. **Manage the Digital Resource Centre with Object Library to facilitate MiC and MiMEP Adoption with 50,000 target number of visits to the Digital Resource Centre (refer to Agenda item 4.6)**
- b. **Identify and Promote Practical Solutions bringing Significant Gain to Construction Productivity**
Promotion of the identified 10 solutions in private projects would commence in 2024.
- c. **Identify Innovation Technology to enhance Productivity Significantly in Building Projects**
- d. **Preparation of Marketing Works for the CIC Innovation Award 2025**

Members had no comments on the status of Com-PRO KPIs 2023 & 2024.

4.4 **Status of Identification of 10 Solutions for Improving Construction Productivity**

**CIC
Secretariat**

The Secretariat identified and presented 10 solutions for improving construction productivity. Solutions were identified from the meetings, interviews and site visits with current construction practitioners including contractors, professional bodies and work associations, suppliers, innovation technology seminars and forums.

The 10 solutions were:

- 1. **Concrete Sensor:**
Using concrete sensors to obtain the concrete strength figures instead of traditional concrete cube test at laboratory to save time and acquire accurate data.

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2. **High Strength Steel Material – S690:**
It is a high strength steel possesses lower material cost, less welding time, which can improve construction quality and safety.
3. **Acoustic Metamaterials:**
A lighter, more durable, environmentally friendly sound absorption artificially engineered materials used on construction site. Effective sound blocking facility can minimize noise interference to neighborhood as well as securing project progress especially in foundation stage.
4. **Gondola-free Water Tightness Test:**
Adoption of robotics to do the water tightness test at curtain wall to replace the conventional way of working on gondola by workers.
5. **Drilling Robot for Projects Installation:**
It can automatically mark and adapt planned drill holes to minimize errors and improve coordination with different working parties.
6. **Artificial Intelligence (AI) Rock in Ground Investigation Logging:**
This is a new research deliverable under Research and Development Fund by Construction Industry Council (CIC). Using AI system and cloud base platform to store and process core-logging tasks on site can reduce manual paperwork and mitigate human chronic strain from logging.
7. **Painting Robot:**
It assists with painting work on site in a timely and effective manner. It also helps reducing the demand on semi-workers for better manpower utilization.
8. **Framework for Project Management Enhancement:**
To groom potential construction practitioners to the higher project management level to meet the manpower shortage, relevant courses will be essential for them to develop soft skills and gain competency.
9. **Cost-Based Procurement:**
The New Engineering Contract (NEC) options C and D are contracts that involve shared risk between the client and the contractor. In these contract options, the contractor is incentivized to explore innovative construction methods to

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enhance project performance and productivity. This shared risk approach encourages collaboration and a proactive mindset from the contractor to drive efficiency and deliver successful outcomes for the project.

10. Drone Survey – Aerial Light Detection and Ranging (LiDAR) Inspection:

Utilizing drones for confined space aerials survey mapping and inspection works is safer and cost effective.

The Secretariat summarized that these 10 solutions would be promoted to industry via webinar or seminar in early 2024 and would collect data and feedback from contractors and suppliers to review the innovative technology adoption and productivity performance.

Members suggested sharing the successful project references from users' perspective on CIC's website to promote the innovative application for productivity enhancement. The Secretariat took note of the comments and would follow up accordingly.

4.5 Research & Technology Development (R&D) Fund Agenda 2024

**CIC
Secretariat**

The Secretariat presented the proposed R&D funding agenda 2024 which are stated as below:

- a. Advance Internet of Things (IoT) construction tools to enhance construction productivity
- b. Innovative technologies/ tools for efficient and effective construction management
- c. Development of A.I for construction productivity enhancement
- d. Development of advance construction materials
- e. Development of unmanned construction machinery application

The Secretariat also presented 2024 R&D Funding Schedule in which it would be divided into 4 quarters:

- a. Q1. (January to the end of March) - Application opening
- b. Q2. (April to the end of June) - Application assessment
- c. Q3. (July to the end of September) - Committee Endorsement
- d. Q4. (October to the end of December) - Project Commencement

Members had no adverse comment on the proposed funding agenda. About the 2024 schedule, members suggested exploring the feasibility of revising the current R&D schedule and speeding up the application assessment and endorsement progress. The Secretariat took note of it and would follow up. Revised schedule would be circulated to members

Action

for review.

4.6 High Productivity Construction – Modular Integrated Construction (MiC) & Multi-trade Integrated Mechanical, Electrical and Plumbing (MiMEP) CIC Secretariat

a. Report KPI of MiC 2023 & 2024

- i. The Secretariat reported the successful completion of KPI regarding the Master Class on MiC Project Management (Project Managers) with over 100 graduates.
- ii. The Secretariat reported the status of the MiC website click rate. As of the end of November 2023, the click rate has exceeded 270,000 clicks. The Secretariat anticipates the target of 300,000 clicks will be achieved by the end of December 2023.
- iii. Regarding the Com-PRO KPI for the Digital Library, the Secretariat reiterated the agreed two-stage plan: issuing Expression of Interest (EOI) as first stage while preparing MiC & MiMEP starter guide / reference materials as second stage. For the EOI status, the Secretariate reported the members that the EOI has been issued to stakeholders listed on the Buildings Department List of Pre-accepted MiC systems, List of Consultants of AACSB and List of Specialist Contractor of MEP on 1 December 2023. As of the meeting date, a total of 19 of stakeholders had expressed interest in contributing to the digital library. The Secretariate expects to receive the necessary information by 29 December 2023 and plans to publish the relevant and useful information on CIC MiC website for public reference.
- iv. The Secretariat restated the approved KPI for MiC 2024 and presented the plan and approaches for implementation in the subsequent agenda items.

b. Report on MiC & MiMEP upcoming events

- i. The Secretariat reported that the final report on Nam Cheong 220 had been distributed to members for review and comment and no comment were received and hence would be released officially in Q1 2024. Meanwhile, webinar on Nam Cheong 220 has been scheduled on 19 December 2023 to provide valuable insights and knowledge on this subject matter.
- ii. The Secretariat proposed the plan of coming events in 2024.

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Firstly, organizing a visit to the MiC mock up units at Yuen Long for the Fire Station-cum-Ambulance Depot with Departmental Quarters and Facilities in Area 72, Tseung Kwan O. Secondly, organizing a factory visit for the MiC project - High West Site Development for the University of Hong Kong (HKU) with webinar follow up for broader audience. Thirdly, grand opening of the MiC Centre after renovation is proposed to take place in Q3 2024. Lastly, a series of webinar on MiMEP experience sharing in Q4 2024. Members suggested having Chinese Medicine Hospital for one of the MiMEP experience.

Members had no further comments on the proposed plan.

c. Proposal for MiC Centre Revamp (for approval)

- i. The Secretariat presented the revised design proposal for the MiC Centre Revamp. The primary objectives of the centre are twofold: to gain public recognition and support for MiC & MiMEP and provide a deeper understanding of MiC & MiMEP technologies to construction stakeholders with a technical background. To achieve this dual objective, the proposed design incorporates the use of digital equipment, which allows for the creation of two separate exhibition content areas within the same physical space.
- ii. The Secretariat proposed the option of receiving donations from the industry stakeholders as a means to ensure that the MiC Centre showcases the latest technologies while delivering value for money. To allow various stakeholders a fair opportunity to showcase their technologies, express of interest will be issued to MiC & MiMEP suppliers, contractors, consultant.

Members had no further comments on the proposed plan and thereby approved accordingly.

- iii. The Secretariat presented a status update on the ongoing discussions with Chinachem and Gammon regarding the replacement of existing negative ward next to the MiC Centre with the Tonkin Street mock up. The Secretariat reported that Gammon's proposed cost for the mock up amounted to at least HK\$4M excluding the expense related to modifying the existing foundation, removing the negative ward, etc. The Secretariat sought members' advice on whether it was advisable to pay for a mock up when there were many GBA suppliers willing to provide one free of charge. Members

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suggested exploring options for a concrete mock-up through donations from various stakeholders instead of making a payment. The Secretariat would prioritize the removal of the existing negative ward as the initial step in the process.

4.7 **Applications for the CIC Research and Development (R&D) Fund – AI-based Real-time Construction Progress Monitoring System**

**CIC
Secretariat**

Mr. LEE Kai Sun from Chun Wo Construction & Engineering Co., Ltd. presented the proposed research. The aim of the proposed research was to develop an AI-based real-time construction progress monitoring system targeted to monitor the number of site workers from different sub-contractors and the progress of 11 interior work trades such as plastering work and door installation work. The research team is planning to collect data through fixed “fish-eye camera” for AI-training and site inspection record.

Members concerned about the practicality and possibility of using wired “fish-eye cameras” to collect data for AI training under variable site conditions especially in building project. Also, Members doubted the replicability of the development in terms of excessive hardware cost. Members suggested that the research team could adopt mobile devices for data collection and utilize BIM model with LiDAR technologies to achieve more practical and sustainable research outcomes.

Members declined the R&D application submitted by Chun Wo. The Secretariat would announce the application result to the research team accordingly.

4.8 **Final Presentation on the Funded Research Project – Autonomous Mobile Robot for Material Delivery and Site Inspection**

**CIC
Secretariat**

Mr. CHAN Cheung-Ho and Mr. PONG Kuong Hon presented their final KPIs achievement of their funded project. Shui On completed the development of the Autonomous Mobile Robot (AMR) with SLAM navigation, automatic material delivery function, 360camera progress record function and AI safety monitoring and alerting function. Three KPI achievements have been presented and demonstrated via videos: Adopting the AMR in 4 building projects, Reducing the material delivery time by 50% and Reducing 3 man-hour per day by using AMR.

Action

Members had no adverse comments on the research and accepted the KPI achievements stated in the project agreement. The Secretariat would liaise with the project team for the closing of the project.

- 4.9 **Final Presentation on the Funded Research Project – Study of Artificial Intelligence for Road Surface Depression Detection Using 3D LiDAR Data** **CIC Secretariat**

Prof. Charles WONG Man Sing from The Hong Kong Polytechnic University presented the research progress. The aim of the proposed research was to develop an A.I. road surface depression detection algorithm, a 3D point cloud library for the defects, a set of tools for the detection, a user guideline as well as a manual and standard to detect the defects. The AI detection algorithm was accomplished at the end of November 2023 and adopted by the Highways Department for highways maintenance.

Members had no adverse comments on the research and accepted the research outcomes stated in the project agreement. The Secretariat would liaise with the project team for the closing of the project.

- 4.10 **Consultancy Services on Digitalising Construction for Enhancing Project Delivery** **CIC Secretariat**

Ms. Didi MAK from Llewellyn & Partners Co. Ltd. reported the progress of their consultancy services. The team had submitted the draft of the final report and the Best Practice Guidebook. The digital maturity assessment result was counted based on 1) Construction and 2) Environmental, Social, and Governance (ESG) performance index to establish a unique zonation of digital maturity type for the local projects. After collecting data from ten selected local projects, the most prioritized digital technologies, including Common Data Environment (CDE) and Building Information Modelling (BIM), were identified during the assessment. Besides, local projects could examine the prioritized strategies by performances to indicate the strategies when starting a project. The teams introduced the design of best practice guidebook and online self-assessment tool to publish one-off results for the local projects. The online self-assessment tool will be launched to the public as a webpage hosting in the CIC server.

Members suggested circulating the drafted best practices guidebook to the members for review before publication. The Secretariat would follow up accordingly and further liaise with the project team to monitor the final stage of the consultancy services.

- 4.11 **Course for Senior Executive** **CIC**

Action
Secretariat

The Secretariat presented the background, intent and outline of the course for senior executives. Two options for engaging institute for course design and development and delivery were proposed: tendering and non-procurement items. The Secretariat also sought members' advice on the course content, expenses and return.

Members suggested considering various universities for innovative and advanced technology. The Secretariat would further consider and circulate a paper to seek pre-approval for proceeding non-procurement item.

4.12 Any Other Business

All to Note

a. Merger of COM-PRO and COM-CBD (Construction Business Development)-and members in 2024

The Com-PRO and Com-CBD were suggested to be merged in 2024 to enable a more comprehensive and coordinated approach. The details of merger would be further discussed and disclosed. The Secretariat took note of it and would follow up.

4.13 Next Meeting 001/24

All to Note

The next meeting would be held on 19 March 2024 tentatively. The Secretariat would inform Members upon confirmation of the meeting details.

The meeting was adjourned at 6:00 pm.