Inventory of Adopting Artificial Intelligence (AI) Technology in Capital Works Projects
for Technical Circular (Works) No. 3/2026

Ref no.	Use Case	Background	Baseline Requirements	Outcome
AI-1	Design Optimisation (by AI or Robotic Process Automation (RPA))	Traditional design process remains heavily reliant on manual iteration and repetitive rule-based calculations, which is time consuming and only limited number of design options could be developed in a tight schedule, and often result in over-designed output. With the help of AI / RPA tools, time saving and free-up human resources can be allocated for more strategic, value-driven steering to achieve more cost-effective design outcome.	(In this issue, design of **foundation** and **earth retaining structure** are required to adopt to AI / RPA) 1. Incorporate prevailing design codes and standards applicable to the corresponding design discipline. 2. Employ generative design and / or parametric algorithms to produce and / or evaluate design options. 3. Identify non-compliance in design element(s) with explanation. 4. Enable communication across different design software and platforms. 5. Support open data exchange formats (IFC) to integrate with BIM platforms. 6. Facilitate automated documentation and reporting in design-related deliverables.	A "Design Optimisation Report" should be prepared to demonstrate how the design were enhanced by AI / automation, including the time saving and the enhanced utilisation rate[1] after adopting AI / automation in the design cycle. The Report should be submitted as a deliverable under the consultancy agreement.

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[1] In general, utilisation rate (U/R) refers to the "actual performance value" / "maximum allowable performance value" ratio. For example, in foundation design the utilization rate is "actual applied load" / "maximum bearing capacity". For element with multiple performance requirements, only the U/R of the most critical performance requirement should be presented.

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AI-2	Checking of Tender Document	Handling pages of tender document when a design proceeds to construction is always time-consuming. In order to save manpower and work-hours, AI-assistant can automate the checking of tender documents against the standard provision and functional clauses. The project team can therefore spend more time to focus on project specific requirements which value most.	1. Establish a Retrieval-Augmented Generation (RAG) or equivalent framework to retrieve from a version-controlled knowledge library (with PAH, memos, circulars, standard terms and conditions, etc). 2. Allow users to manage the content of the knowledge library when requirements and stipulations are published, updated or suspended. 3. Verify users' input and identify omission or non-standard provision with links to the source content for user's verification. 4. Enable importing and exporting function in workable formats (e.g. MS Word).	A summary should be prepared along with the completed tender document to demonstrate how the checking assistant involved, e.g. the completed document is checked against the knowledge library and complied with standard terms & conditions, etc. The summary should be submitted for Client's checking.

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AI-3	Information Retrieval and Reporting from Digital Works Supervision System (DWSS)	There are three core functional components under the DWSS – workflow management, smart construction management and smart document management. Large amount of useful data and information are stored within this live-updating central database. A Retrieval Augmented Generation (RAG) framework can allows users to search and retrieve relevant real-time information from the three core components of DWSS, the results can facilitate presentation, data analysis and report generation.	1. Able to access the database of DWSS (e.g. forms and records, smart site application data, project documentation etc.). 2. Allow advanced semantic and natural language query to search relevant information from the database by a RAG or equivalent framework. 3. Display concise, presentable summaries (e.g. in table format, etc) as per user's request of data retrieved with links to the source content for user's verification. 4. Use specified template to generate reports (e.g. progress report, etc) with information retrieved, able to export in workable formats (e.g. MS Word). 5. Provide a user interface accessible across desktop and mobile platforms with a clear display of search results and sources. 6. Enforce role-based access right if operation includes restricted / confidential information.	A summary should be prepared to demonstrate how the retrieval and reporting assistant involved in daily operation, e.g. what kind of reports or analysis result are generated / partly generated with help of the AI assistant. The summary should be submitted, as an annex in progress report, for the Client's information.