

**Assignment Brief**

**of**

**Provision of Construction Safety Artificial intelligence (AI) Large Language**

**Models (LLMs) Solutions**

**for**

**the Construction Industry Council**

June 2024

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## **Table of Contents**

	Page
1. Background	3
2. Objectives	5
3. Scope of the Consultancy	5
4. Presentations	20
5. Deliverables	21
6. Nursing and Maintenance	24
7. Brief Programme	24
8. Management of the Contractor	26
9. Contractor's Office and Staffing	27
10 Payment Schedule	28
11 Intellectual Property Rights	29
12 Confidentiality	30
13 Interview	31
14 Submission of Proposals	32
15 Technical Proposal	35
16 Technical and Fee Evaluation	36
Annex A - Indemnity and Intellectual Property Right Indemnities	37
Annex B - Reply Slip for Declining Bid	38
Annex C - List of Data	40
Annex D - Information Technology Security Policy Version 3.6 26/9/2023	42
Annex E – Statement of Compliance	43
Annex F - Reply Slip for Interview Session	44

## **1. Background**

1.1 CIC was founded in 2007 under the Construction Industry Council Ordinance (Cap. 587). CIC consists of a chairperson and 24 members representing various sectors in the industry, including employers, professionals, academics, contractors, workers, independent persons, and government officials.

### **1.2 CIC Functions**

#### **1.2.1 Main Functions**

The functions of CIC are

- (a) to advise and make recommendations to the Government on strategic matters, major policies and legislative proposals, that may affect or are connected with the construction industry, and on matters of concern to the construction industry;
- (b) to reflect to the Government the construction industry's needs and aspirations;
- (c) to elevate the quality and competitiveness of the construction industry by promoting the ongoing development and improvement of the industry;
- (d) to uphold professionalism and integrity within the construction industry by promoting self-regulation, formulating codes of conduct and enforcing such codes;
- (e) to improve the performance of persons connected with the construction industry through establishing or administering registration schemes or rating schemes;
- (f) to advance the skills of personnel in the construction industry through planning, promotion, supervision, provision or coordination of training courses or programmes;
- (g) to encourage research activities and the use of innovative techniques and to establish or promote the establishment of standards for the construction industry;
- (h) to promote good practices in the construction industry in relation to dispute resolution, environmental protection, multi-layer subcontracting, occupational safety and health, procurement methods, project management and supervision, sustainable construction and other areas conducive to improving construction quality;
- (i) to enhance the cohesiveness of the construction industry by promoting harmonious labour relations and the observance of statutory requirements relating to employment, and by facilitating communication among various sectors of the industry;
- (j) to serve as a resource centre for the sharing of knowledge and experience within the construction industry;
- (k) to assess improvements made by the construction industry through the compilation of performance indicators;

- (l) to make recommendations with respect to the rate of the levy imposed under this Ordinance;
- (m) to conduct or finance educational, publicity, research or other programmes relating to occupational safety and health, environmental protection or sustainable development in the construction industry; and
- (n) to perform any other functions relevant to the construction industry, including those functions conferred or imposed on it by or under this Ordinance, the Construction Workers Registration Ordinance (Cap.583) or any other enactment.

### 1.2.2 Supplementary Functions

- (a) to provide training courses for the construction industry;
- (b) to establish and maintain industrial training centres for the construction industry;
- (c) to assist, including by the provision of financial assistance, in the placement of persons who have completed training courses provided for the construction industry;
- (d) to assess the standards of skills achieved by any person in any kind of work involving or in connection with the construction industry, to conduct examinations and tests, to issue or award certificates of attendance or competence, and to establish the standards to be achieved in respect of any such work.

## 1.3 CIC Organisation Structure

### 1.3.1 Organisation Structure

Leading by the Executive Director, five functional divisions establish and implement the strategic direction of CIC.

- (a) Industry Development
- (b) Hong Kong Institute of Construction (HKIC)
- (c) Registration Services
- (d) Trade Testing
- (e) Corporate Services

### 1.3.2 Organisation Chart

Refer to the organization chart from CIC website URL:

[https://www.cic.hk/eng/main/aboutcic/leadership/Org\\_Structure/](https://www.cic.hk/eng/main/aboutcic/leadership/Org_Structure/)

- 1.3.3 The CIC intends to engage a Contractor (the “Contractor”) who has profound knowledge in AI to provide consultancy services for the implementation of Construction Safety AI Solutions with Large Language Models (LLM). The development of LLM is expected to take 4 months, followed by a One-year maintenance period.

## **2. Objectives**

2.1 The objectives of this Assignment Brief are to acquire Services (“the Services”) to:

- (a) Utilise the AI-powered solutions and leverage Construction Safety domain-specific knowledge to enhance Safety aspects of operations in construction site,
- (b) Develop a construction safety knowledge base using AI technologies.
- (c) Build an intelligence NLP system that can understand and process language (English, Traditional Chinese, and Simplified Chinese) within the context of safety domain knowledge, enabling it to provide accurate response;
- (d) Improve site safety by leveraging AI-driven insights based on the relevant regulations and guidelines;
- (e) Develop web-based user-friendly interfaces to allow users to interact naturally with a bot; and
- (f) Provide APIs to for future integration with other applications.

## **3. Scope of the Consultancy**

The scope of the Consultancy shall include but not limited to the following:

### **3.1 Overall Scope**

**3.1.1** The Contractor is required to provide end-to-end solution to deliver an A.I. Large Language models (LLMs)-powered web-application and messenger service tailored for the Architecture, Engineering, and Construction (AEC) industry in Hong Kong to enhance the project delivery performance in particular on construction safety.

The AI Safety Chatbot is expected to be completed within a timeframe of 4 months. Following the completion, there will be 3 months nursing period to ensure smooth integration and adoption of the chatbot. Additionally, the Contractor will be responsible for providing maintenance and support for a duration of 1 year.

**3.1.2** This platform is intended to redefine the paradigms of information accessibility, project collaboration, and intelligent digital assistance within the sector by utilising cutting-edge A.I. technology The Construction Safety Chatbot will be web-based and support WhatsApp. CIC has OnePass for user management functions including authentication as in 3.2.8.

- 3.1.3** The envisioned solution will serve as a pivotal tool for AEC professionals, offering instant access to an extensive repository of engineering documents and data. This immediate accessibility is crucial for streamlining the search process, significantly reducing the time spent by professionals in locating necessary information, thereby accelerating project timelines and enhancing overall productivity.
- 3.1.4** A cornerstone of this platform will be its sophisticated A.I. chatbot with “Multi-Turn” and “Multi-Source” Functions, designed to provide precise, contextually relevant assistance. The chatbot will be adept at handling inquiries specific to engineering practices in Hong Kong, equipped with the capability to cite construction safety related sources directly within its responses. The chatbot should default to Hong Kong Cantonese and answer users' questions based on the input language, such as English, Traditional Chinese with local Cantonese style, or Simplified Chinese. The chatbot should also support voice input. Transcription and translation are required to convert audio to text. The platform will enable easy navigation to these citations, fostering an unprecedented level of transparency and user validation in digital support tools for the AEC industry.
- 3.1.5** An AI-powered chatbot with the ability to cite up-to-date data sources directly is being developed. For this purpose, the Construction Industry Council (CIC) will provide about 6 GB of data, including safety policies, guidelines, safety procedures, safety references, training materials, and related content. These resources will be available in various formats such as PDFs, Word documents, PowerPoints, photos, YouTube videos, and illustrations. A list of data can be found in **Annex C**.
- 3.1.6** The chatbot will be designed to automatically generate in-text citations for every document referenced above in its AI responses. This ensures that proper credit is given to the original sources of information. Also, the chatbot can navigate to and highlight the specific sections within the original documents being referenced. This feature enables users to easily locate and review the relevant information within the provided resources.
- 3.1.7** Structured Feedback Loop for Continuous Evolution
- The platform will incorporate a structured feedback loop, allowing it to evolve in response to user feedback and shifts in industry practices. This approach ensures the platform's sustained relevance and utility, aligning with our dedication to excellence and a user-centric design philosophy.
- 3.1.8** Stakeholders Feedback Collection
- The CIC will be responsible for arranging meeting(s) or interview(s) to consult with relevant users and stakeholders to understand their needs in applying AI to improve their operational efficiency and productivity. The Contractor is required to attend 6 meetings or interview(s) in person during the first year to introduce

and collect the usages and feedback of Chatbot. The contractor is expected to prepare a report or output summarising the feedback received from users and stakeholders. This report should include an analysis of the feedback, key insights, and recommended actions based on the feedback collected.

## **3.2 Mandatory Services of the LLM**

### **3.2.1 Comprehensive Engineering Document Repository**

Implement an extensive database of engineering documents and data, optimised for instant access. This repository should be searchable through advanced A.I. algorithms, capable of understanding and processing complex engineering queries to significantly diminish the time professionals spend searching for information.

### **3.2.2 A.I. Chatbot for Contextual Assistance**

Develop a sophisticated A.I. chatbot that offers precise, contextually relevant answers to engineering inquiries, specifically tailored to Hong Kong's engineering practices. The chatbot must cite sources within its responses, with functionalities allowing users to directly navigate to these citations, thereby ensuring transparency and reliability.

For instance, the chatbot can draft a method statement and cite related safety guidelines and rules, along with their sources. Additionally, it can facilitate compliance checking and improvement by allowing users to upload a method statement for evaluation and feedback.

### **3.2.3 Real-Time Data Synchronization and Cloud Storage**

Data should be securely stored in an auto-scaling cloud database, with real-time synchronization between the web platforms. This ensures data consistency and accessibility across different platforms.

### **3.2.4 Admin Dashboard for Data Analysis**

An admin dashboard is required for data retrieval and analysis, offering statistical insights to monitor platform usage, user engagement, and feedback for continuous improvement.

### **3.2.5 Integration with Social Media Messengers and Multimedia Queries**

The platform could facilitate multi-user collaboration within a secure, private environment, enabling effective communication and project management among AEC professionals. This includes features for sharing, saving, and categorizing A.I. responses by project or topic for easy retrieval.

### **3.2.6 Structured Feedback Loop for Continuous Evolution**

Incorporate a structured feedback mechanism to collect user inputs and industry trends, enabling the platform to adapt and evolve in alignment with changing industry practices and user needs.

### **3.2.7 User Management, Authentication, and social sign-in methods Sign-Up**

The online web registration system for listed contractors. Listed contractors should be able to login easily by entering their company name and password, with a 'forgot password' function for added convenience. with forgot password function.

To further enhance user convenience and engagement, the web-LLM should provide the capability for users to ask questions through various WhatsApp numbers.

### **3.2.8 User Account Management**

Works Contractors (End users) should have the privilege to register and create company accounts for the AI chatbot. Each contractor's account will come with unlimited questions. The administrator can assign users to the chatbot.

Number of end users should be about 350, referenced to the lists of Work Contractors and HKCA Contractors: [https://www.devb.gov.hk/en/construction\\_sector\\_matters/contractors/contractor/index.html?search=true&category=&group=](https://www.devb.gov.hk/en/construction_sector_matters/contractors/contractor/index.html?search=true&category=&group=) , [Members' List - Hong Kong Construction Association \(HKCA\)](#). CIC reserves the right to change the End users.

Register account information should include at least the Company name, contact information, project information and password. The Contractor shall be responsible for the integration of user management functionalities, including but not limited to user sign-up, authentication, and user profile management, into the CIC OnePass platform. The underlying platform of CIC OnePass is Okta which employs industry-standard integration protocols such as OIDC/OAuth, 2FA, JWT, and APIs. It is incumbent upon the Contractor to demonstrate their proficiency in the implementation of these protocols, with the aim of ensuring a secure and efficient integration with the CIC OnePass platform.

### **3.2.9 Model Selection and Development**

The Contractor shall propose appropriate models, whether open-source or closed-source, for the CIC's consideration. The Contractor shall present the benefits and potential drawbacks of each model, considering factors such as



accuracy, language support, fine-tuning options, and licensing requirements. The justification provided should align with the specific needs and goals of the CIC, taking into account factors such as cost-effectiveness, scalability, ease of integration, and the ability to adapt and improve the model over time. Moreover, the Contractor shall consider any potential risks associated with the selected model, such as data privacy concerns, security vulnerabilities, or limitations in terms of handling complex user queries or understanding context. The proposed model should be tailored to meet the unique requirements of the CIC, ensuring that it can effectively handle the expected workload, deliver accurate responses, and provide a seamless user experience.

### **3.2.10 Model Training**

The Contractor shall also be responsible for the training of the selected model. This process involves acquiring and preprocessing the relevant training data, selecting appropriate algorithms and techniques, and iteratively fine-tuning the model to improve its performance. The Contractor shall collaborate closely with the CIC to define the specific training objectives, data requirements, and performance criteria to ensure that the trained model aligns with the desired outcomes.

During the model training phase, the Contractor shall employ best practices and industry standards to ensure the reliability, accuracy and efficiency of the trained model. The Contractor shall also document the training methodology.

The Contractor shall consider the scalability and efficiency of the training process. Throughout the training process, the Contractor shall monitor and optimize the model performance.

### **3.2.11 Model Evaluation**

The Contractor shall conduct thorough model evaluation and performance analysis to assess the effectiveness and efficiency of the model. The evaluation should consider factors like accuracy, response time, scalability, and resource utilization to ensure optimal performance under different user loads and usage scenarios. Specifically, the target response time for the chatbot should be no more than 5 seconds. Additionally, the Contractor shall collaborate with the CIC to define a comprehensive set of performance benchmarks and establish target thresholds for the chatbot's performance, ensuring that it meets or exceeds the desired standards.

### **3.2.12 Model Deployment and Hosting**

The Contractor shall assist the CIC in setting up an appropriate infrastructure or environment for deploying and integrating the trained model into the chatbot system, ensuring seamless functionality and optimal performance. The Contractor shall propose the most cost-effective hosting and deployment approaches for CIC's consideration.

To drive the industry adoption, unlimited usage for each user would be preferred, but not mandatory. Reserved capacity for model processing, like provisioned throughput, would also be preferred. If it is token-based, the Contractor shall advise any quota limits of the chatbot for each user. The Contractor shall advise the recommended number of tokens per user per month to ensure efficient utilization and cost optimization. The Contractor shall further provide detailed insights on the scalability options, such as auto-scaling, to accommodate potential increases in user traffic without compromising performance.

Additionally, the Contractor shall outline any potential data storage requirements, including the need for backups and data retention policies, to ensure data integrity and compliance with relevant regulations. Furthermore, the Contractor shall propose a robust monitoring and reporting system to track the chatbot's usage, performance metrics, and any potential issues or bottlenecks for timely resolution.

### **3.2.13 Charging Mechanism for Token-based Chatbot**

In the case where the deployed chatbot operates on a token-based system with limited quota, the Contractor shall propose a charging mechanism to enable users to top up their token quota. This mechanism should ensure a seamless and user-friendly experience while providing a fair and transparent approach to token consumption and charging.

The Contractor shall consider various factors when designing the charging mechanism, including the pricing structure, token package options, and payment methods. The Contractor shall provide recommendations on the appropriate token pricing based on factors such as the chatbot's expected usage patterns, the value provided to users, and any associated costs incurred. The pricing structure may include options for one-time token purchases, subscription plans, or a combination of both to cater to different user preferences and needs.

Furthermore, the Contractor shall propose a user-friendly interface or system that allows users to easily top up their token quota. This interface should provide clear instructions, secure payment gateways, and convenient options for users to track their token usage and balance.

In addition to the charging mechanism, the Contractor shall advise on any necessary technical integrations or APIs required to support the payment system.

This may involve collaborating with payment service providers or implementing secure token exchange protocols to ensure a smooth and secure transaction process.

### **3.2.14 Flexibility for On-premises Deployment**

If the proposed solution is cloud-based, the Contractor shall ensure that the solution is flexible and portable, allowing for migration to on-premises infrastructure if required.

### **3.2.15 Model Re-training after Deployment**

To ensure the chatbot's continued effectiveness, the Contractor shall propose a mechanism for periodic re-training of the deployed model, such as MLOps. The re-training process shall involve collecting new training datasets, such as new safety guidelines, and data from user interactions, including feedback and user queries that were not adequately addressed by the existing model.

During the re-training phase, the Contractor shall utilize the new data to update the model and improve its performance. The Contractor shall advise best practices for re-training, including proper validation and testing procedures to ensure that the updated model meets or exceeds the desired performance benchmarks.

By implementing model re-training, the Contractor should ensure that the model remains up-to-date and capable of delivering accurate and relevant responses as user needs evolve over time.

### **3.2.16 Model Ownership and Transferability**

The account ownership of the cloud environment and the trained model shall be owned by CIC. CIC shall have full rights and control over the trained model developed under this project, including its usage, modification, and deployment.

In the unlikely scenario where the Contractor does not transfer ownership to the CIC, and the Contractor's engagement with the CIC comes to an end or the CIC decides to engage another Contractor for the continued development or maintenance of the trained model, the Contractor shall ensure the transferability of the trained model. The Contractor shall provide all necessary documentation, source code, and methodologies required for the seamless transfer of the trained model to another entity. CIC will control over all aspects of the trained machine learning system, including the underlying infrastructure, models, data, and training processes.

The Contractor shall develop a detail handover plan and shall maintain clear and organised documentation, including but not limited to, the model architecture, hyperparameters, data preprocessing steps, and any modifications made during the training process. This documentation shall be comprehensive and easily understandable to facilitate the transfer of knowledge and enable future contractors to continue working with the trained model effectively.

Moreover, the Contractor shall provide any necessary assistance or support during the transition period to ensure the successful handover of the trained model. This may include conducting knowledge transfer sessions, answering queries, and providing technical guidance to the new contractor.

➤ By ensuring the transferability of the trained model, the Contractor enables the CIC to have full control and ownership over the chatbot developed under this project while also allowing for a smooth transition to another contractor if desired by the CIC in the future.

### **3.3 API**

**3.3.1** The Contractor shall adopt an API-first approach for developing consistent and reusable APIs. Early communication with CIC is essential for stakeholder agreement on API design.

**3.3.2** The Contractor shall provide an API design specification compliant with the Open API Specification (OAS). The developed API will be integrated with CIC's API Management Platform, ensuring secure and standardised interactions. The proposed integration approach, including API security aspects such as authentication and authorisation, must align with CIC's practices and receive CIC's approval prior to implementation.

**3.3.3** The Contractor shall provide API for construction companies to build on top of the LLM produced.

### **3.4 Data Engineering and Data Modelling**

**3.4.1** The Contractor is responsible for the ETL process of construction safety data. The Contractor shall suggest appropriate method for the ingestion of each data types, such as using OCR and image recognition for PDF documents. The Contractor shall suggest appropriate storage option for the structure and unstructured data.

**3.4.2** The Contractor shall design a data source ingestion flow and update mechanism to ensure the system's continued reliability and accuracy. This applies to both the English and Chinese language training models.

- 3.4.3** The Contractor shall customise and optimise the AI models based on the collected operational and technical requirement. The AI models shall be tailored to CIC-provided datasets and other external data.
- 3.4.4** The Contractor shall validate and test the accuracy the trained AI models using appropriate metrics. CIC will provide a test case consisting of 50 questions with preset answers. The chatbot will need to provide similar answers to those preset answers. The Contractor shall propose a mechanism to prevent overfitting or underfitting of the model to the fine-tuning data. The Contractor will report and present in two rounds of presentations for the committees.
- 3.4.5** The Contractor shall design automatic monitoring and alerting for early detection of technical issues, troubleshooting, prevention of data downtime and abnormal usage / query from end users.
- 3.4.6** The Contractor shall develop a content-moderation mechanism to ensure the AI-generated content complying with the relevant regulations and standards as required by the CIC.

### **3.5 Chatbot Delivery**

- 3.5.1** The Contractor is responsible for the deployment of the knowledgebase and AI solutions from development/UAT environment to UAT/production environment.
- 3.5.2** The Contractor shall provide post deployment support and testing. The Contractor shall monitor and notify the CIC of any incidents related. TWO (2) environments, including development and production, shall be provided for various development, testing and quality assurance activities without affecting the live service.
- 3.5.3** The Contractor shall ensure the knowledgebase and trained AI model between different environments are consistent.
- 3.5.4** The Contractor shall be responsible for development, prototyping, refinement, and deployment.
- 3.5.5** The Contractor shall be responsible to plan, arrange and propose the UAT with the CIC. The Contractor shall liaise with CIC and may have to come to CIC office for testing and deployment. The UAT test plan shall be submitted by the Contractor for CIC's approval.
- 3.5.6** The Contractor shall rectify any identified problem during the UAT within Three (3) days upon notification or other timeline as agreed with the CIC.

- 3.5.7** The Contractor shall fix any problem encountered during the nursing period in maximum Five (5) days upon notification or other period as agreed with the CIC.

### **3.6 Support Devices and Browsers**

#### **3.6.1 Mobile Application Compatibility**

Should a mobile application be applicable, it must be compatible with the following operating systems to ensure proper display and functionality:

- Apple iOS 14 or later versions
- Android 10 or later versions

#### **3.6.2 Web Browser Compatibility**

The system should be fully functional and display correctly on the following browsers:

- For Microsoft Windows 10 and 11:
  - Microsoft Edge (Chromium-based only), supporting the three most recent stable major versions
  - Google Chrome, supporting the three most recent stable major versions
- For MacOS 12 or later versions:
  - Google Chrome, supporting the three most recent stable major versions
  - Safari, supporting the three most recent stable major versions

### **3.7 Operations Standard**

#### **3.7.1 System Maintenance**

#### **3.7.2 Standard Operating Procedure (SOP)**

SOP document covers step-by-step administrative and operation guide. Vendor should submit to CIC for comment and approval. SOP should support daily and regular tasks and it should cover, but does not limit to, below topics.

- (a) Roles and Responsibilities
- (b) Specific Procedures – describe each step of the procedure and mention any known hazards or difficulties.
- (c) Resources – include any resources that can help execute the procedure safely and effectively.

### **3.7.3 Data Maintenance Operation**

- (d) Data backup and restore
- (e) Data retention
- (f) Log management (access log and transaction log), etc.
- (g) Database monitoring such as database connections, resource utilisation, slow queries. Depending on the hosting model, CIC IT will determine the monitoring requirements with contractor.

## **3.8 Knowledge Transfer**

**3.8.1** The Contractor shall organize at least ONE (1) on-site three hours training session for 30 industry participants. The user guide, training materials and manuals provided and submitted should be in English and cover the project objectives, AI and LLM definitions, the journey of the Chatbot's development, benefits, challenges, and include a one-hour hands-on LLM development training section. The training will be video recorded.

**3.8.2** A set of used training materials, LLM data and basic architecture, framework should be open to CIC.

**3.8.2** Conduct the handover knowledge transfer session for CIC staff.

## **3.9 Technical Advisory**

**3.9.1** The Contractor shall provide technical advisory to end users and troubleshooting regarding the technical issues and incidents related to the AI solutions.

## **3.10 Optional Services**

The Contract may be required to carry out additional work on a time and materials basis at the agreed rates. The Contractor shall quote the unit rate for the relevant type of personnel for the optional items in the Fee Proposal, which CIC could be able to opt for throughout the contract period.

Other items of work directly or indirectly related to this Agreement may be added by the CIC with the agreement of the Contractor and shall form part of the overall scope of the Agreement and be covered by the terms of the Agreement with additional fees that shall be mutually agreed by the CIC and the Contractor.

### **3.11 Project Management**

**3.11.1** A Project Steering Committee (PSC) shall be formulated to govern the project progress for decision-making. The PSC is the forum for final decisions with representatives from the senior management of the Council.

The Contractor is responsible for the project management of the project and provides the following services but are not limited to:

**3.11.2** Be responsible for the total project management and act as a single contact point to the CIC regarding all related activities of the project;

**3.11.3** Take the lead in coordinating the CIC with various other parties for the smooth implementation of the project. The other parties include but are not limited to sub-contractors who may involve in the design and architecture of the new platform;

**3.11.4** Resolve conflicts and crises during the entire project life cycle;

**3.11.5** Oversee and monitor the progress of various activities during the project life cycle to ensure that these activities are completed according to the implementation schedule and meet the project requirements;

**3.11.6** Prepare a running list of project backlog items to promote project transparency. Report and follow up on all outstanding issues with all related parties. Suggest solutions and resolve difficulties throughout the project; and

**3.11.7** Plan and schedule meetings to update project progress and a milestone regularly during the project life cycle to enable an agile and collaborative feedback loop between the CIC project team and the Contractor. Attending meetings as may be reasonably requested by the CIC; and

**3.11.8** Follow-up of all outstanding issues arising from regular reporting and relevant meetings with all related parties and stakeholders, suggesting solutions, raising out and resolving difficulties and ensuring the Deliverables would be submitted with quality for CIC's approval in a timely manner.

**3.11.9** In the future, there are plans to deploy and relocate the cloud data to a data centre for operation. The contractor should address these key aspects to ensure a successful and reliable transition of the cloud data to the new data centre, meeting the CIC's operational requirements and service level expectations.



### **3.12 Language**

- 3.12.1** The solution shall be on both data input and display and must specifically support English, Traditional Chinese and Simplified Chinese characters; and
- 3.12.2** The support should include Hong Kong Supplementary Character Set (HKSCS) and the Unicode (UTF-8) format.

### **3.13 Environment**

- 3.13.1** The entire system architecture and operation shall be designed as always on and should not experience any downtime, even during resource scaling, software updates and deployment.
- 3.13.2** To maintain consistency and accuracy in our data processing and analysis, the entire system architecture shall be aligned with the one utilized with the data source system.

### **3.14 Security**

- The Contractor shall observe CIC's Information Technology Security Policy (IT-SOP-04) in designing the solution. Annex D is the Table of Content of IT-SOP-04.
- 3.14.1** The Contractor shall deliver the solution that meets the OGCIO's baseline IT Security Policy published on their website ([https://www.ogcio.gov.hk/en/our\\_work/information\\_cyber\\_security/governme nt/](https://www.ogcio.gov.hk/en/our_work/information_cyber_security/governme nt/))
- 3.14.2** The Contractor shall carry out Security Risk Assessment & Audit and fix the identified risks up to CIC's satisfaction before the launch of the platform in accordance with the [Practice Guide for Security Risk Assessment & Audit](#), [Practice Guide for Mobile Security](#) and [Practice Guide for Cloud Computing Security](#). If any hosting services are required, the hosting provider shall comply with the Information Security Management System (ISMS) specification ISO27001:2013 and shall provide the corresponding certificates to CIC for review;
- 3.14.3** All cookies shall adopt the secure flag, and all session cookies shall use HTTPS protocol;
- 3.14.4** Has spam, bot protection and mitigation using reCAPTCHA or other advanced risk analysis mechanisms within the entire integration;

**3.14.5** The Contractor shall source a third-party audit assessor to conduct a Security Risk Assessment and Audit (SRAA) and submit the corresponding report to CIC; and

**3.14.6** The Contractor shall also support fixing any issues reported by the CIC-appointed security assessor, up to CIC's satisfaction, before the launch of the Services.

### **3.15 Data Security**

**3.15.1** The Contractor shall propose and apply measures (e.g. encryption for data at rest and data in transit) on data protection, transfer, retention, and removal for information security protection.

**3.15.2** All information must be encrypted during transmission over communication networks whenever applicable, such as between web server and database, client and web server, and other inter-server data exchanged , including through API calls.

**3.15.3** A declaration of whether accessing data is necessary by the Contractor/vendor, inclusive of sub-processors and their engineers, is required. If data access is required, it should be stated whether approval is sought by CIC. Maintenance of an access activity log, including the reason for access, the specific data accessed, and the duration of access, is required. Confirmation of whether the Council is informed of any data access activity before, during, and/or after such access is required.

**3.15.4** All user and system access to sensitive data and cryptographic keys shall be strictly controlled and tracked by audit trail; and

**3.15.5** Industry-standard encryption algorithms such as AES-256 must be used to mask and encrypt sensitive data on all related servers, including backups and databases, to prevent data breaches.

### **3.16 Data Privacy**

**3.16.1** The Contractor shall design the platform, data schema, and data storage with the least impact on personal privacy. It is mandatory for the proposed solution that observes the Hong Kong Personal Data (Privacy) Ordinance.

**3.16.2** The Contractor shall include information to clarify how their design addresses the SIX (6) data protection principles.

- 3.16.3** The Contractor shall carry out Privacy Impact Assessment (PIA) for personal data (and the credentials) to be stored on the platform at the agreed point of time.
- 3.16.4** Purpose and Details of Information Access: Definition and agreement on the specific purpose and details of the information and data to be accessed by the third party are required.
- 3.16.5** Right to Audit: CIC maintains the right to audit third-party compliance with data privacy and security requirements at any time.
- 3.16.6** Return of CIC's Data and Assets: Agreement to return all project data and assets upon project completion or contract termination is required from the third party.
- 3.16.7** Data Retention and Disposal: Third-party adherence to agreed-upon data retention requirements and assurance of proper disposal or deletion of CIC's data when it is no longer needed or upon CIC's request are required.
- 3.16.8** Assurance of Consistency with Security Requirements: Third-party assurance that products or services are consistent with CIC's security requirements is required. This assurance should extend to any subcontracting arrangements.
- 3.16.9** The Contractor shall clear any legal implications regarding the system operation by adding proper disclaimer, statement and measures in the system for worker data collection and sharing.
- 3.16.10** The Contractor shall restrict the use of any personal data the Contractor may collect during the course of the contract for a purpose which is related to this Assignment Brief.
- 3.16.11** The Contractor should assure its sub-contractor(s), if any, provides the same level of protection (technical and administrative) and compliance control.
- 3.16.12** The Contractor shall notify CIC within TWENTY-FOUR (24) hours of any security or data breaches and the remedial action to be taken by means of email notification or in writing.

### **3.17 Data Sovereignty/Residence and Service Continuity**

This section outlines expectations regarding data and service locations, location change handling, and data transfer/discontinuation handling.

- 3.17.1** Transparency of Locations: Disclosure of the locations of data, development, and delivery centres is required. If these centres are in geopolitically sensitive areas, documented contingency plans for emergency location switching are necessary.

**3.17.2 Options for Location:** Contractual obligations should include informing the Council of options for storing data, servers, and applications in various geographical locations such as Hong Kong, China, or Europe.

**3.17.3 Disclosure of Engineer Locations:** Disclosure of the locations of engineers, sub-processors, and sub-contractors, including those responsible for software updates, cloud services, support, and other professional services, is required. If these locations are in geopolitically sensitive areas, mitigating steps should be taken before contract signing and emergency response plans and potential business impacts should be documented.

**3.17.4 Notification of Changes:** Contractual obligations should include informing the Council of any changes in the development or support locations for products or services in use.

**3.17.5 Data Extraction and Migration:** Identification and specification of the specific tools or formats necessary for data extraction are required. If services are discontinued, a specification of whether professional services are needed for data migration is required. If charges apply for these services, the pricing structure should be clearly stated.

### **3.18 Audit Control**

**3.18.1** Logs shall be created for the following:

**3.18.2** All system access, including successful and failed attempts;

3.18.2.1.1 All data updates; and

3.18.2.1.2 All system and application errors.

**3.18.3** Log entries shall include sufficient information to support comprehensive audits of the effectiveness of the system and its compliance with security measures, such as the user identity, IP address, timestamp, actions taken, geolocation, etc.;

**3.18.4** All logs shall be accessible by CIC at any time; and

**3.18.5** The system shall retain logs for a period commensurate with their usefulness as an audit tool. During this period, all records shall be secured so that they cannot be modified but can only be read by authorized persons.

## **4. Presentations**

4.1 Appropriate presentations shall be given during meetings to solicit comments and/or seek approval from relevant parties as required by the CIC.

- 4.2 The Contractor shall attend meetings with the CIC for any modifications of the equipment as necessary.
- 4.3 The presentation materials shall be either in English or Traditional Chinese as appropriate to the target audience.

## **5. Deliverables**

The Consultant shall provide the following Deliverables to the CIC within the time frame specified below:

- 5.1 A functional AI chatbot capable of understanding user intents, indexing and searching through thousands of engineering documents, and providing relevant responses with in-text citations within minutes.
- 5.2 AI chatbot should be able to navigate to and highlight the referenced section within the original document.
- 5.3 The AI chatbot should exhibit a high level of conversational ability, engaging users in natural and human-like interactions. It should be capable of understanding user intents accurately, extracting relevant information, and generating contextually appropriate responses. The chatbot's conversational skills should create a seamless and personalized user.
- 5.4 AI chatbot should have Easy-to-use interface for users to retrieve past conversations and access relevant documents. This feature enables users to easily refer back to previous interactions and review information shared during conversations. The interface should support efficient search and retrieval of conversation history and associated documents.
- 5.5 The chatbot should support tagging and categorising data. This feature allows users to label and categorize conversations, documents, or specific pieces of information for easy retrieval and better organization.
- 5.6 Integration of the chatbot with target communication channels/platforms. The chatbot should be seamlessly integrated with the target communication channels or platforms identified during the project. This integration will enable users to interact with the chatbot through various channels, such as websites, messaging apps, CIC Super Apps, or social media platforms.
- 5.7 A knowledge base containing accurate and up-to-date information for the chatbot to utilize on. The chatbot should be equipped with a knowledge base that contains accurate and up-to-date information on a range of topics relevant to the project's requirements. The knowledge base will serve as a reference for the chatbot to provide informative and helpful responses to user queries. It should be regularly updated and maintained to ensure the chatbot's responses are accurate and reliable.

- 5.8 Comprehensive documentation, including architectural diagrams, user guides, and maintenance instructions. The documentation will serve as a reference for future maintenance, updates, and enhancements. It should provide clear instructions on how to deploy, configure, and maintain the chatbot effectively.
- Successful testing and quality assurance results, ensuring the chatbot's reliability and accuracy. The expected outcome is a successful testing phase with minimal issues or bugs. Functional testing will validate the chatbot's behaviour, while performance testing will assess its responsiveness and scalability. User acceptance testing will involve real users interacting with the chatbot to evaluate its effectiveness.
- 5.9 The chatbot should be successfully deployed in the production environment, ensuring it is accessible to users. The deployment process should consider scalability, reliability, and security aspects to handle a potentially large user base. The chatbot should be able to handle concurrent user interactions efficiently without compromising performance.
- 5.10 The execution of this Project and all Deliverables shall comply with the Contract requirements to the satisfaction of CIC. In case of ambiguities in any requirements in the Contract, CIC shall have the final jurisdiction on the explanation and approach of implementation to meet the needs. The Contractor shall follow the description of the requirements and the instructions given by the CIC to implement the solution to the satisfaction of the CIC. The Contractor shall not be entitled to any additional charges resulting thereof.

The time frame for submission of the training materials is subject to change by the CIC. The Contractor shall be prepared to allow flexibility in the project plan to allow for changes in the work schedule due to comments, suggestions, and lead time for endorsement or approval made by the project team. The Contractor shall not be entitled to any additional charges resulting thereof.

- 5.11 The Contractor shall propose a complete project schedule with the planned completion date for each task. Milestones / Major Tasks and their required deliverables are listed as follows, with the completion date listed in **Section 7** Brief Programme:
- Initiate a project kick-off meeting with the submission of a project timeline, project team organisation with contact details and set up a project team communication channel list, preferably Microsoft Teams;
  - Schedule project status meetings and project steering meetings to sync up with CIC regularly to report on general project status, achievements, next fortnight's tasks, risks and mitigations;
  - Schedule two architecture review sessions. The first one is scheduled before implementation and the second one should be scheduled before each production rollout to ensure the architecture to release meets the original design agreed in the first review session. Compliance checks with CIC infrastructure/cloud/network teams will also be required for each production releases.

- Complete the user requirement collection and use case ideation, with the submission of a technical design specification;
  - Provide key visual mock-up, layout design guidelines and detailed high-fidelity wireframes to define the design system and user journeys to deliver the storytelling message and data insights;
  - Develop the relevant data pipelines with quality assurance;
  - Complete the Load/Stress Test, System Integration Test (SIT) and User Acceptance Test (UAT) and submit the following documents to CIC for comment and approval, including the testing approach, test plan, scripts, and reports
  - Standard Operating Procedure (SOP)
  - Remediate or mitigate the findings reported in the SRAA conducted by a third-party security assessor and any additional results reported by the CIC Cybersecurity team, follow 3.14.
  - Complete the system nursing period and submit any logs of problems and incidents incurred during the period for CIC's comment and approval; and
- (h) Conduct the handover knowledge transfer session for CIC staff or appointed contractor.
- Update relevant training material and manuals mentioned in 3.8.
- 5.12 All Deliverables produced by the Contractor shall be subject to approval by CIC. CIC will endeavour but is not bound to provide comments on the Deliverables within **TWO (2)** weeks upon receipt. The Contractor shall rectify and supplement within **ONE (1)** week upon receiving comments from the CIC and the stakeholders. Approval of layouts shall be obtained before starting the related production.
- 5.13 All project assets shall be submitted electronically in their native editable file format of the original authoring software, together with a corresponding exported readily printable PDF format, if applicable.
- 5.14 The Deliverables shall be in English with UK spelling variants unless otherwise specified.
- 5.15 The Contractor shall ensure that the electronic deliverables and software are not infected by any malicious code like computer viruses, worms, Trojan horses, and logic bombs, which could cause damage to the CIC systems. The Contractor shall also ensure that there is no loophole and backdoors in the electronic deliverables or software that would breach the security control. Any code for developers' debugging and convenience of whatsoever purpose, which would not contribute to the production system, shall be removed before the delivery.
- 5.16 Upon requests by CIC, the Contractor shall submit a rectification proposal of which the Contractor needs to propose rectification measures and take actions to catch up with the



agreed progress and to improve the quality of the Deliverables to the satisfaction of the CIC.

- 5.17 The Contractor shall provide assistance to cover all system technical knowledge transfer, source code review, release notes, and deployment procedures during different project milestone subject to CIC's request and availability during the project and warranty period.

## 6. Nursing and Maintenance

- The Contractor should provide a free nursing period for at least **Three (3) months** after the production launch.
- 6.1 Supporting services should include phone and email inquiries and be provided from Mondays to Fridays during office hours (9:00 a.m. to 6:00 p.m.)
- The Contractor shall provide ONE (1) year of maintenance services and supports to the CIC after the nursing period. During the maintenance period, the Contractor shall provide technical support regarding the system usage and necessary fixes and fixing bugs on a live system shall be given priority over other support requests. Technical support should be provided for necessary fixes to minimise the service interruption and impact on the users. The Contractor must fix critical problems within TWO (2) working days; minor problems within TEN (10) working days after being notified. If the issues are out of the scope of the projects, the Contractor should give an acceptable explanation. Supporting services should be provided from Monday to Friday during office hours (09:00 a.m. to 6 p.m.).
  - The Contractor shall maintain and update the documentation stipulated in Section 7.2 as part of the Maintenance and Support Services, to handle data model fixing and data source update such as new guideline/ materials available in 2 weeks time.
  - Upon completion of **ONE (1)** years of maintenance service, the Contractor shall ensure a smooth handover of the system for CIC or other contractor maintenance. The Contractor will need to cooperate with other services providers for the maintenance the AI-trained models and logic flows.
- 6.2 The LLM, along with all trained models and data, should be ready for relocation to CIC's data centre at any time. The contractor should ensure a smooth transition during this process.

## 7. Brief Programme

- The Project is expected to be commenced nursing June 2024 and shall be completed within **(4)** months from the commencement date of the Services, which the CIC shall decide upon engagement. CIC shall supervise the whole project, and the project period may be revised with the agreement between CIC and the Contractor.



7.1 The Contractor shall complete the service requirements addressed in Section 3 Scope of Service and Section 5 Deliverables per the milestone schedule stated in Section 7.2 below.

7.2 Milestone Schedule

<b>Deliverable</b>	<b>Description of Deliverables / Key Activities</b>	<b>Estimated Deadline / Time Frame (from the Commencement of the Consultancy)</b>
Project Initiation	<ul style="list-style-type: none"> <li>- Detailed Project Plan</li> <li>- Project Organisational Chart</li> </ul>	T + 1 Week
Requirement Study & Use cases Ideation	<ul style="list-style-type: none"> <li>- Users' requirement</li> <li>- Proposed use cases</li> <li>- Design and Technical Specification</li> <li>- Architecture Diagram</li> <li>- Network diagram and illustration</li> <li>- Architecture Review Session</li> </ul>	T + 2 Weeks
Development, UAT & Rollout	<ul style="list-style-type: none"> <li>- UAT test plan</li> <li>- UAT chatbot</li> <li>- Load test plan</li> <li>- High availability test plan</li> <li>- Security test plans</li> </ul>	T + 8 weeks
	<ul style="list-style-type: none"> <li>- All test plans with execution result</li> <li>- Endorsement / Approval Construction Safety LLM Chatbot by the Committee the CIC</li> </ul>	T + 4 months
Knowledge Transfer	<ul style="list-style-type: none"> <li>- Endorsement / Approval Management use Dashboard</li> <li>- Knowledge Transfer workshop</li> <li>- Standard Operating Procedure (SOP)</li> </ul>	1 month after Endorsement / Approval Construction Safety LLM Chatbot
Project Report	<ul style="list-style-type: none"> <li>- Identified data issues, if any, and recommendation of remediation</li> <li>- Operation/support manual</li> <li>- Deployment / installation and Configuration manual</li> <li>- Training materials</li> </ul>	2 months after Endorsement / Approval Construction Safety LLM Chatbot

<b>Deliverable</b>	<b>Description of Deliverables / Key Activities</b>	<b>Estimated Deadline / Time Frame (from the Commencement of the Consultancy)</b>
	Handover guide and other documentations necessary for maintaining, supporting, and administering the deliverables	
Warranty	Nursing Period	3 months after Endorsement / Approval Construction Safety LLM Chatbot
	Maintenance – One year Maintenance Period after the completion of nursing period.	1 year after Endorsement / Approval Construction Safety LLM Chatbot

- 7.3 The Contractor shall notify CIC when a potential or actual delay arises and shall detail what, in his opinion, are the reasons for the delay, the consequences or likely consequences of the delay and any additional time would be anticipated when comparing to the baseline programme or the previous version of programme preferably in the form of a bar chart / Gantt Chart. Subject to the approval of an extension of the project period, the Contractor shall prepare a revised Detailed Working Programme for CIC's comment and approval.

## 8. Management of the Contractor

- 8.1 The Contractor shall be directed and supervised by the CIC. The Contractor must allocate sufficient resources to complete the Project according to the Detailed Working Programme as approved by the CIC.
- 8.2 The reviewers of this Consultancy shall include Committee on Safety and Committee on Building Information Modelling (BIM) and Construction Digitalisation formed under the CIC. The CIC Secretariat will facilitate the CIC in supervising the Contractor.
- 8.3 The Consultant shall obtain the approval of the CIC (where appropriate) before commencement of each stage of this Project.
- 8.4 For the avoidance of doubt, the meaning of “to the satisfaction of the CIC” or “approval by the CIC” shall mean the attainment of approval from Committee on Safety and Committee on Building Information Modelling and Construction Digitalisation as necessary.
- 8.5 The Project Manager and other relevant project team members shall attend all the

meetings as called upon by the CIC in relation to this Project or specified in the Assignment Brief.

- 8.6 The Project Manager shall be available as the sole contact person for all matters related to the Consultancy.

## **9. Contractor's Office and Staffing**

- 9.1 The Contractor shall maintain an office in Hong Kong for the duration of this Project.

- 9.2 The composition of the project team shall also include at least the following team members:

### **9.2.1 Project Manager**

- Over SEVEN (7) years of IT project management;
- Over FIVE (5) years of experience in delivering similar services;
- Relevant project management certification would be an advantage;

### **9.1.2 Solution Architect**

- Over FIVE (5) years of IT experience;
- Over FIVE (5) years of implementation experience in AI, LLM, NLP, API;

### **9.1.3 System Analyst / AI Engineer**

- Minimum of THREE(3) years of working experience in developing enterprise IT solution
- At least TWO (2) completed AI projects on similar scopes.

### **9.1.4 Construction Engineer / Safety Officer Advisor**

- Minimum of **TEN (10)** years of working experience in construction industry and related professional qualifications. Proficiency in English and Chinese.
- The major duties of the Part-time Engineer / Safety Officer are to provide valuable construction domain knowledge and advice when developing and training the LLM, such as in-depth understanding of the potential questions of LLM chatbots, familiarity with safety regulations and measures, requirements, development of method statements, and traditional safety processes in the construction industry.

- 9.2 The Contractor's project team (except administrative support staff) shall have the experience of undertaking projects of similar nature and scope to those required in this Project. With the prior approval of CIC, the Contractor may outsource some of the tasks if the Contractor deems the expertise and experience of the sub-concentrator fits for performing the tasks that could achieve the objectives set out in this Assignment Brief. However, the Contractor shall be the ultimate responsible party of the Project and remain liable for any act or omission of the approved sub-contractor(s).
- 9.3 No additional fee or expenses rendered locally or overseas for the provision of any specialist or sub-contractor services required for the satisfactory completion of the Project shall be payable by the CIC.
- 9.4 The Contractor shall provide details of key project team members, including the Project Manager, Solution Architect, System Analyst / AI Engineer and Part time Engineer / Safety Officer, if any, to be deployed on this Project together with their curriculum vitae, proof of qualifications and project references as well as staffing input for this Project for approval of the CIC. Separate permission from the CIC should be obtained for any subsequent changes of staff and sub-contractor (s).
- 9.5 The Project Manager shall attend all the meetings as may be called upon by the CIC.
- 9.6 The Contractor shall provide staff and manpower input in accordance with the technical proposal made at the RFP stage, and the CIC shall have the right to check the time-log record of the Contractor's staff deployed for the Project.
- 9.7 In the event of any deviation or change of team members with respect to the submitted tender, prior approval from the CIC must be sought.
- 9.8 The Contractor shall maintain the project team with all identified team members as required in Section 9.2 above throughout the Project. In the event, for reasons beyond its control, the Contractor is unlikely to provide or maintain any key staff, such as sub-contractor fits for performing the tasks that could achieve the objectives and sub-contractor as specified in the Technical Proposal or deployment plan approved by the CIC, it should report to the CIC as soon as practicable and propose for the CIC's approval of a substitute with equivalent experience and qualifications of the person who is leaving the project team. The Contractor acknowledges that any changes of members in the project team shall not discharge the Contractor's obligations under this Project.

## **10 Payment Schedule**

- 10.1 Upon acceptance and/or approval of the Deliverables for each Payment Stage/Date by the CIC, and upon the submission of invoices to the CIC by the Contractor, the Contractor shall be paid in accordance with the following payment schedule within THIRTY (30) calendar days of the receipt of the invoices subject to verification of the invoice. The payment schedule is as follows:

## 10.2

**Mandatory Items**

<b>Payment Stage</b>	<b>Project Deliverables / Milestone</b>	<b>Payment Schedule (%)</b>
1	Upon commencement of the Services	30%
2	Completion of user requirements collection, and technical design specifications of <b><u>the UAT delivery</u></b> .	20%
3	Completion of the <b><u>Construction Safety Chatbot</u></b> delivery as stated in Clause 7.2, subject the CIC's satisfaction.  Completion of the knowledge transfer and update of all system documentation to the final version.  Completion of nursing period.	50%
<b>TOTAL</b>		<b>100%</b>
<b>Items as requested and confirmed by the CIC</b>		
1	Upon commencement of one year maintenance period	100%

**Optional/Additional Items**

<b>Payment Stage</b>	<b>Project Deliverables / Milestone</b>	<b>Payment Schedule (%)</b>
<b>Optional/ Additional Items as requested and confirmed by the CIC</b>		
1	On actual basis upon satisfactorily receipt or approve respective optional / additional item by the CIC	100%

- 10.3 The percentages of payment do not imply or indicate the relative or absolute amount of resources and expenses to be spent by the Consultant to produce the concerned Deliverables and to complete the tasks and services of the Consultancy.

**11 Intellectual Property Rights**

- 11.1 The ownership of any Intellectual Property Rights subsisting in the Deliverables as described in Section 5 and any documents, materials, data, web-based model and other

information prepared or collected by the Contractor, its specialist(s), sub-contractor(s) and their employees and agent(s) in the course of this Project shall be vested in the CIC.

- 11.2 The Intellectual Property Rights shall not apply to any pre-existing Intellectual Property Rights of materials that were not created as a result of this Project yet are incorporated or used in the performance of this Project. The Contractor shall acquire and transfer to CIC all necessary consents, licenses, approvals, patents, copyrights and the like incidental to the Deliverables for the CIC's use and publication as applicable.
- 11.3 The Contractor shall warrant that no Intellectual Property Rights of any third parties have been or will be infringed in the course of or as a result of the Project. Should the Contractor's works involve any Intellectual Property Rights infringement of a third party's work or any elements partially copied or modified from a third party's work, the CIC would not be held liable. Regarding Indemnity and Intellectual Property Right Indemnities, please refer to **Annex A**.

## 12 Confidentiality

- 12.1 Except otherwise explicitly declared by the CIC as non-confidential, all information and documents provided by the CIC to the Contractor or created by the Contractor in the course of or as a result of the Project shall be regarded as Confidential Information. The Consultant shall take all practical measures to protect the Confidential Information from unauthorized access, erasure or using for purposes other than this Consultancy.
- 12.2 The provision of Confidentiality as mentioned in Section 12.1 shall not apply to the following:
- (a) Disclosure of Confidential Information to the Contractor's specialist(s), sub-contractor(s) and their employees and agent(s) as necessary for the performance of the Project;
    - The Confidential Information is already known by the recipient(s) or has become public knowledge, except by the breach of the confidential obligation of the Contractor;
  - (b) Disclosure of Confidential Information is required by the law, order of the Court or arbitral authority of competent jurisdiction. The Contractor shall detail the procedures for when an authority requires access to data and associated systems/applications. Clarify how the geographical location of the data and the jurisdiction of data centres influence these procedures. The Contractor shall include necessary steps to ensure compliance with the laws of the respective jurisdictions.
  - (c) Disclosure of Confidential Information is with prior written consent from the CIC.
- 12.3 The Contractor shall ensure that all receiving parties of the Confidential Information are

informed with its confidential nature and direct the receiving parties to treat such information confidentially. The Contractor shall be responsible for the consequences of any breach of the confidential obligation.

12.4 The Contractor shall not make any public announcement, press releases or otherwise publicise the information of the Project without first obtaining prior written approval of the CIC.

12.5 Conflict of Interest and Code of Conduct for Staff

(A) On appointment and during the currency of this Project, the Contractor must declare any interest if it is considered to be in real or apparent conflict with the Project. The Contractor shall not undertake any services, which could give rise to conflict of interest, except with the prior approval of the CIC which approval shall not be unreasonable withheld.

(B) In any case, the Contractor or any of his associated companies shall not undertake any services for a consultant in respect of a contract between that consultant and the CIC for which the Contractor is providing a service to the CIC.

(C) The Contractor shall implement a system requiring his employees to declare to him any interest they or their immediate families may have, or any conflict between their personal interest and their official positions, in relation to this Project.

(D) The Contractor shall prohibit his employees to take up any outside work or employment, which could create or potentially give rise to a conflict-of-interest situation in connection with this Project.

(E) The Contractor shall take adequate measures to protect any confidential / privileged information entrusted or obtained in relation to this Project; and his employees must not disclose to a third party any such information without prior consent from the CIC.

## 13 Interview

During the evaluation stage, Contractor will be requested to attend an interview to present their proposals. Contractors are requested to attend an interview which will be held in the afternoon of **17 June 2024** to present its Technical Proposal. Please fill and return the Reply Slip for Interview Session in Annex F.

Upon receipt of a request from the CIC, Contractor shall provide a presentation to demonstrate whether the proposal can fulfill the requirements specified in the Assignment Brief and its Annexes.

The presentation shall include:

(A) Overview of Safety LLM

Explain the architecture, design principles, and underlying technologies of the Construction Safety AI chatbot.

Highlight the scale and capacity of the model in terms of parameters, training data, and computational requirements.

(B) Technical solutions- Demo Showcase

Demonstrate the AI LLM chatbot in action through live demonstrations and interactive scenarios.

Showcase its ability to understand and generate natural language, answer questions, provide recommendations, or assist with language-related tasks.

Tailor the demo to highlight specific features or functionalities that are relevant to Safety needs and objectives.

Demonstrate how companies build on top of the LLM produced

A full list of data could be found in Annex C.

13.1 The presentation shall be set up with the Contractor's own resources and expense. The CIC shall not bear any costs associated with it.

- In view that the interview forms part of the technical assessment, Contractor should NOT disclose any fee related information during the interview including PowerPoint presentation and handouts. Failure to do so will result in disqualification.
- Each interview presentation should be no longer than twenty (20) minutes, including a five (5) minute question and answer session.

## 14 Submission of Proposals

14.1 Contractors intending to bid for this project shall submit its Technical Proposal and Fee Proposal with all documents and information required in accordance with the terms of this RFP invitation on or before **14 June 2024** (Request for Proposal ("RFP") Closing Date) in one of the submission methods as stated in Sections 14.2 and 14.3. Any RFP proposals submitted through a method other than Paper-based Submission or Online System Submission will not be considered.



## 14.2 Paper-based Submission

- 14.2.1. Consultants shall deposit their Technical Proposal and Fee Proposal in separately sealed envelope to **CIC Headquarter, 38/F, COS Centre, 56 Tsun Yip Street, Kwun Tong, Kowloon on or before 6:15 p.m. on the RFP Closing Date**. The CIC's date chop on the envelopes shall be taken as the date of submission of the proposals. Late submission will NOT be considered.
- 14.2.2. A two-envelope approach is adopted for the submission, i.e. interest Contractors shall submit the **(1) Technical Proposal** including all related information in one envelope and **(2) Fee Proposal** in a separate envelope. **Please be reminded NOT to enclose any price information in the Technical Proposal. Failure to do so would lead to disqualification.**
- 14.2.3. Consultants shall submit **ONE (1)** set of hard copies and **ONE (1)** set of corresponding files in electronic form (e.g. MS Word / MS Excel / PDF format) stored in an electronic medium (e.g.: CD-ROM or USB drive) of the Technical Proposal in a sealed envelope marked **“Technical Proposal”** and **ONE (1)** set of Fee Proposal in a separate sealed envelope marked **“Fee Proposal”** clearly indicating the Consultant's name and proposal title. In the event of discrepancies between original and electronic versions of the RFP Submission, the former shall prevail.

## 14.3 Online System Submission

- 14.3.1. Consultants shall deposit their Technical Proposal and Fee Proposal **through the CIC Supplier Portal** in accordance with the requirements of the Portal **on or before the RFP Closing Date**. The submission will not be considered if the relevant proposal, document or information is not successfully uploaded and transmitted through the Supplier Portal and accepted by the CIC before the RFP Closing Date.
- 14.3.2. A two-envelope approach is adopted for the submission, i.e. interested contractors shall submit **(1) Technical Proposal** including all related information stated in the Assignment Brief under the “Technical Submission” session of the CIC Supplier Portal and **(2) Fee Proposal** under the “Fee Submission” and “Price Supplementary Submission” sessions of the CIC Supplier Portal. Please be reminded not to enclose any price information in the Technical Proposal. **Failure to do so would lead to disqualification.**
- 14.4 The Contractor is required to complete the **compliance table in Annex E** to indicate the ‘Statement of Compliance’ with section-by-section statement of compliance corresponding to related sections of the Assignment Brief.
- 14.5 Fee proposal would only be opened after the technical assessment is completed subject to Section 14.8 below.

- 14.6 A marking scheme as described below will be used for evaluating the proposals. The proposals shall be evaluated based on two separate aspects, namely the technical assessment and the fee assessment.
- 14.7 The pre-determined weighting for technical and fee assessment is 80% and 20% respectively.
- 14.8 If the technical assessment mark is less than 50% of the maximum mark (i.e. 100 marks), the Technical Proposal will be rejected and will NOT be further assessed and its Fee Proposal envelope will NOT be opened.
- 14.9 The rejected proposal will NOT be included in the weighted technical assessment score formula in Section 16.1 below and the weighted fee assessment score formula in Section 16.2 below. The CIC reserves its right to cancel this exercise and re-issue invitations thereof without further notice to the Consultants.
- 14.10 An assessment panel will be established for the evaluation. The proposals received will be evaluated in accordance with the requirements stated in Section 15.
- 14.11 During the proposal evaluation stage, the vendor may be requested to attend an interview to present his proposals. Upon receipt of a request from the CIC, the vendor shall provide a presentation to demonstrate whether the proposal can fulfill the requirements specified in the Assignment Brief.
- 14.12 The presentation shall be set up with the vendor's own resources and expense. The CIC shall not bear any costs associated with the presentation.
- 14.13 The presentation should at least include the project team profile, the approach to fulfill the objectives described in the Assignment Brief and an outline programme for completing the assignment. Demonstration of the proposed solution or similar solution is also preferred. The presentation shall be conducted, where possible, by the leader of the proposed project team for performing the project management.
- 14.14 In the event that a Typhoon Signal No. 8 or above or Black Rainstorm Warning is hoisted on the proposals closing date, the RFP Closing Date will be postponed to the following working day.
- 14.15 The invited contractor who has decided to decline the bid shall return the Reply Slip for Declining Bid provided in Annex B or reply via the CIC Supplier Portal.

## 15 Technical Proposal

Contractors intending to bid for this project shall submit the Technical Proposal in accordance with the specifications of this Assignment Brief with the details below:

**(a) Contractor's Profile, Job Reference and Track Record (10%)**

- (i) Company profile, background, compliance table and project reference with the associated technologies; and
- (ii) Company track records and relevant experience in the CIC's past FIVE (5) years projects as of RFP Closing Date

**(b) Composition of the Proposed Project Team (10%)**

- (i) An organisation chart indicating the proposed project team structure with all project team members and administration staff;
- (ii) Proposed input (in man-day) from each project team member; and
- (iii) Profile of Project Manager and core project team members to be deployed for this project including the following details:
  - Name
  - Responsibilities / Duties
  - Qualifications and experience (especially of similar nature and scale to this project) including expertise, brief descriptions of the scope, project type, and duration.

**(c) Overall Development and Deployment Approach (40%)**

Approaches to fulfil the scopes of the project and requirements set in this assignment brief:

- (i) Proposal on the overall methodologies (30%)  
Criteria includes but not limited to:-
  - Model selection
  - Model Training
  - Model Evaluation
  - Hosting and deployment
  - Maintenance
  - Suggested Operating Model for Cost Optimization
- (ii) Compliance with CIC's Requirements in accordance to the compliance table in Annex E (10%)

**(d) Proposed Technical Solutions (20%)**

- (i) Proposed system architecture (10%)
- (ii) Technical soundness and feasibility, functional and non-functional features (10%)

**(e) Demonstration/ illustration of the Proposed or Similar Solution in the RFP Interview (10%)**

- (i) Complete the Reply Slip for Interview Session in Annex F

**(f) Proposed Programme for Service Delivery (10%)**

- (i) Detailed timeline and working programme to carry out and complete all the tasks described in this Assignment Brief (10%)

**16 Technical and Fee Evaluation**

**16.1 Technical (80%)**

The weighted technical assessment score of the Technical Proposal shall be determined in accordance with the following formula:

$$80 \times \frac{\text{Technical assessment mark of the concerned proposal}}{\text{Highest technical assessment mark of all proposals}}$$

**16.2 Fee (20%)**

Proposal fee for evaluation shall be the lump sum of Core Items quoted in the Fee Proposal.

The weighted fee assessment score of the Fee Proposal shall be determined in accordance with the following formula:

$$20 \times \frac{\text{Lowest total lump sum fee of all proposals}}{\text{Total lump sum fee of the concerned proposal}}$$

**16.3 Calculation of Combined Scores**

The combined assessment score of a RFP shall be the sum of the weighted technical assessment score (Section 16.1) and the weighted fee assessment score (Section 16.2).

## **Annex A - Indemnity and Intellectual Property Right Indemnities**

### Indemnity

The Consultant shall indemnify and keep the CIC indemnified from and against:

- (i) all and any demands, claims, actions, arbitrations, proceedings, threatened, brought or instituted against the CIC; and
- (ii) all liabilities and indebtedness (including without limitation liabilities to pay damages or compensation), loss, damage, costs and expenses incurred or suffered by the CIC (including all legal and other costs, charges, and expenses, on a full indemnity basis, which the CIC may pay or incur in initiating, defending, counter-claiming, settling or compromising any action or proceeding by or against the CIC).

which in any case being arisen directly or indirectly relating to the Contract.

### Intellectual Property Right Indemnities

The Consultant shall indemnify and keep the CIC, its authorized users, assignees and successors-in-title (hereinafter “indemnified parties”) indemnified from and against:

- (i) all and any demands, claims, actions, arbitrations, proceedings, threatened, brought or instituted against the indemnified parties; and
- (ii) all liabilities and indebtedness (including without limitation liabilities to pay damages or compensation), loss, damage, costs and expenses incurred or suffered by indemnified parties (including all legal and other costs, charges, and expenses, on a full indemnity basis, which indemnified parties may pay or incur in initiating, defending, counter-claiming, settling or compromising any action or proceeding by or against indemnified parties).

which in any case being arisen directly or indirectly relating to the Contract.

## Annex B - Reply Slip for Declining Bid

With reference to your Request for Proposal (“RFP”) invitation, I/we regret that I am/we are unable to bid due to the following reason(s):

*(Please tick against the box(es) where applicable)*

- ☐ Inadequate time to prepare Technical and Fee Proposals.

Suggested timeframe for proposal preparation: \_\_\_\_\_ days

- ☐ Invitation document contains insufficient details.

Suggested supplementary details:

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- ☐ Work scope too broad.

Would you consider bidding if the work scope is reduced?

☐ Yes

☐ No

Or which part(s) of the work scope shall be reduced to facilitate your consideration in bidding (please specify)?

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- ☐ Work scope too narrow.

Would you consider bidding if the work scope is broadened?

☐ Yes

☐ No

Or what supplementary details shall be added to facilitate your consideration in bidding (please specify)?

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- ☐ Not interested in this type of service.

- ☐ Working at full capacity at the moment.

- ☐ Work scope beyond firm's / organisation's expectation.

☐ Cannot meet project time schedule.

Suggested timeframe for the project: \_\_ months

☐ Requirements / Specifications too restrictive.

☐ Others (please specify):

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Signature	:	<hr/>
Full Name of Contact Person	:	<hr/>
Position	:	<hr/>
Name of Company	:	<hr/>
Telephone No.	:	<hr/>
Fax No.	:	<hr/>
E-mail	:	<hr/>
Date	:	<hr/>

Note:

- Please return the completed reply slip to fax no: 2100 9439 or email: seanso@cic.hk no later than 12:00 on 14 June 2024.
- (1) Please contact Mr. Sean SO (Tel: 2100 9088 ; Email: seanso@cic.hk) for any enquiry about this RFP.

**Annex C - List of Data**

Total 6gb data source of the CIC knowledgebase will include:

	Department / Organisation	Major Folder	
1	Architectural Services Department (ASD)	➤ 工地安全、健康及環境保護資料 (工具箱訓練教材及工地安全網上學習課程等)	Pdf  Words  PowerPoints  Webpages  Scanned copies in pdf  YouTube videos
2	Building Department (BD)	➤ 作業守則及設計手冊 (作業守則、工程守則及監工計劃書等)	
3	Construction Industry Council (CIC)	➤ 安全刊物 (指引、參考資料、提示/訊息、海報及報告) ➤ 安全短片 ➤ 建造業安全網上研討會 ➤ 「生命第一」	
4	Development Bureau (DEVB)	➤ Construction Site Safety Manual ➤ Design for Safety Guidance Notes	
5	Electrical and Mechanical Services Department (EMSD)	➤ 電力安全 (電力條例簡介、實務守則及電力安全宣傳片) ➤ 鐵路安全 (安全規例簡介) ➤ 關於升降機及自動梯安全 (升降機及自動梯條例簡介及實務守則)	
6	Highways Department	➤ 技術文件 (工作守則)	
7	Hong Kong Housing Authority (HKHA)	➤ 刊物 / 製作 (安全手冊、實務指南及安全指南等) ➤ 影片 ➤ 工具	
8	Hong Kong Construction Association (HKCA)	➤ 電子刊物 (實務指引、工地安全座談培訓套件等)	
9	Labour Department (LD)	➤ 有關職業安全與健康的法例 ➤ 其他有關法例 ➤ 職業安全 (法例簡介、工作守則安全指引、其他安全指南及海報告示)	



		<ul style="list-style-type: none"> <li>➤ 電視宣傳短片及電台廣播</li> <li>➤ 職安警示</li> <li>➤ 職業健康</li> </ul>	
10	Occupational Safety & Health Council (OSHC)	<ul style="list-style-type: none"> <li>➤ 書籍</li> <li>➤ 單張</li> <li>➤ 海報</li> <li>➤ 展板</li> <li>➤ 培訓套件</li> <li>➤ 綠十字</li> <li>➤ 職安健影片</li> </ul>	
11	Temporary Works Forum	<ul style="list-style-type: none"> <li>➤ Publications (A Guide to Good Practice)</li> </ul>	
12	工程術語 地盤術語	<ul style="list-style-type: none"> <li>➤ 網站</li> <li>➤ 清單</li> <li>➤ 影片(YouTube)</li> </ul>	

**Annex D - Information Technology Security Policy Version 3.6 26/9/2023**

**Table of Contents**

1. REVISION HISTORY .....3

2. OBJECTIVES .....4

3. SCOPE .....5

4. REFERENCE.....6

5. DEFINITIONS AND CONVENTIONS .....7

6. CIC IT SECURITY ORGANISATION .....12

7. MANAGEMENT RESPONSIBILITIES .....16

8. IT SECURITY POLICIES .....18

9. HUMAN RESOURCES SECURITY .....19

10. ASSET MANAGEMENT .....20

11. ACCESS CONTROL SECURITY.....22

12. CRYPTOGRAPHY .....25

13. PHYSICAL AND ENVIRONMENTAL SECURITY .....26

14. OPERATIONS SECURITY .....28

15. NETWORK & COMMUNICATION SECURITY .....32

16. SYSTEM ACQUISITION, DEVELOPMENT AND MAINTENANCE.....35

17. OUTSOURCING SECURITY .....37

18. SECURITY INCIDENT MANAGEMENT .....38

19. BUSINESS CONTINUITY MANAGEMENT .....39

20. COMPLIANCE .....40

Vendor could request the document to study if they can compliance with “CIC's Information Technology Security Policy.

**Annex E – Statement of Compliance**

The Contractor is required to complete the following compliance table to indicate the ‘Statement of Compliance’ with section-by-section statement of compliance corresponding to related sections of the Assignment Brief.

<b>Legend</b>	<b>Description</b>
FC	Fully Compliant
BC	Compliant by configuration
RC	Compliant but requires customisation
OF	Optional supported feature requiring additional license/subscription
EX	External Integration requiring additional license/subscription
NC	Non-compliant or functionality is not provided

The Contractor is also required to include a description of how the proposed solution could meet the technical requirements in Section 3 of the Assignment Brief.

<b>Section</b>	<b>Synopsis of Requirements (Refer to Assignment Brief for full descriptions)</b>	<b>Level of Compliance (FC/BC/RC/OF/EX/NC)</b>	<b>Remarks</b>
3.1	Scope of Services	FC	Sample

## Annex F - Reply Slip for Interview Session

I/we would like to attend the Interview Session for the Provision of Construction Safety Artificial Intelligence (AI) Large Language Model (LLM) Solutions for the Construction Industry Council in the **afternoon on 17 June 2024 at Address: Meeting Room 6, 29/F, Tower 2, Enterprise Square Five (MegaBox), 38 Wang Chiu Road, Kowloon Bay, Kowloon, Hong Kong.**

<b>Full Name of Attendee(s)</b>		<b>Post/Title</b>	
<b>Company Name</b>			
<b>Contact Person</b>		<b>Post/Title</b>	
<b>Address</b>			
<b>Telephone No.</b>		<b>Fax No.</b>	
<b>Mobile Phone No.</b>		<b>E-mail</b>	

### Note:

1. Each Contractor shall register four (4) attendees at most.
2. Please contact Mr. Sean SO (Tel: 2100 9088 ; Email: seanso@cic.hk) for any enquiry about this RFP.