**Annex I - Terms of Reference**

**Terms of Reference**

**Digital Project Management & Control Platform Services**

**Guangxi Chongzuo Border Connectivity Improvement Project**

**1.** **Background**

The People’s Republic of China has applied for financing from the Asian Infrastructure Investment Bank (“AIIB”) in the form of a loan toward the cost of Guangxi Chongzuo Border Connectivity Improvement Project (the “Project”). The project owner is Chongzuo Urban Construction Investment & Development Co., Ltd (“the Client”). The project will comprise four components:

Component A: Wuzhou (Longyanzui)-Shuolong Highway (the section of Chongzuo-Jingxi Expressway to Shuolong Port) with the overall length of 17.627km. Among them, the mainline of the expressway is a two-way four-lane expressway that is 12.604km in length with the design speed of 100km/h and the subgrade width of 26m; Shuolong connecting line is a two-way four-lane Class 1 highway that is 5.023km in length with the design speed of 80km/h and the subgrade width of 25.5m. The construction period is 36 months.

Component B: Detian-Shuolong Highway. Connecting Shuolong Port with Detian Waterfall Scenic Area, this subproject has the overall length of 13.728km, design speed of 40-60km/h, subgrade width of 10-16m, the construction period of 20 months.

Component C: Shuolong Port (Shuolong Main Gate-Phase 2) Project. It has planned land area about 18,533.72m2 (about 27.83mu) and total floor area of 11,668.03 m2, including port service center, service station, public toilet, ecological parking lot & supporting road landscaping works, Guichun River Revetment Landscape Park and basement. The construction period is 15 months.

Component D: Technical support and project management, in the selection of a Master Technology Partner to oversee and advise on all technology standards and requirements on the project including the delivery of a Digital Project Management & Control Platform.

In order to strengthen the management & control of the project and create an industry benchmark for large scale infrastructure projects, the Client intends to select the Master Technology Partner and procure the Digital Project Management & Control Platform provided through a Consulting Engagement methodology under an International Open Competitive Selection.

**2. Scope of Engagement of the Master Technology Partner (“MTP”)**

The MTP will be expected to be the lead partner to advise on all technology matters throughout the lifecycle of the project as dictated by the contracting period.

The MTP will set the standards for any technology deployments within the project to ensure compatibility with the specific software solutions that it delivers and provide software solutions, as a service, as required by the detailed requirements.

Detailed Requirements:

1. The MTP will provide a Digital Project Management & Control Platform based on BIM & GIS, assisting the client to better visualize the project, and strengthen the management and control of the project throughout its lifecycle.
2. The MTP will be expected either directly, or through an eco-system of leading technology partners (on written approval of the Client prior to the submission of the Proposal), to evaluate, recommend and oversee the deployment of industry leading solutions that can create a positive return on investment within the project.
3. The MTP will advise on, and set the technology standards for acquisition of all networked hardware/software for all vendor/partners within the project. These standards are to ensure that all data acquisition from any system or device is compatible with the proposed Digital Project Management & Control Platform which will be utilized as the single source of truth for data collection, management, analysis and visualization.

**3. Scope of Services, Tasks (Components) and Expected Deliverables**

3.1 Provision of the Digital Project Management & Control Platform, the specific requirements are as follows:

1. Provide a secure Digital Project Management & Control Platform to digitalize all data inputs from the various systems and devices and visualize these inputs through a comprehensive project management and control application that utilizes a BIM framework system in line with international technical, management and implementation standards. Specific functions that will be required:

* BIM design/construction/completion modelling services for Component A, B and C.
* Platform functionality that can provide solutions that assist in the management and control of the project in areas such as:
  + An intuitive user interface
  + GIS mapping of all essential project equipment with real-time monitoring capabilities
  + Project progress reporting and visualization of progress real-time and with historical recording time/lapse capabilities
  + Project quality management
  + Project safety
  + Project contract management
  + Project Cost control
  + Project Site management capabilities
  + Project Environmental Control and Risk Monitoring
* Deliver Mobile and Web based functionality for the Digital Project Management & Control Platform that provides segmented project team access based in specific user requirements.
* The ability to store all data on the Clients server environment and provide training and operational handover of the systems to the client for day-to-day operations.

1. To provide Information Technology consulting services to the other key project team members as a service. The MTP will be expected to attend all key project meetings either in person or virtually and provide on-demand consulting services for all other document reviews, materials procurement and general advice. These consulting services are specifically to be focused on:

* Ensuring that Information Technology equipment and services acquired by other key project partners is of internationally accepted standards.
* Ensuring that all relevant data collection systems/devices/sensors employed on the project are compatible with the MTP’s Digital Project Management & Control Platform through relevant Access Point Interfaces (‘API’s)
* Ensure that all devices that are to be connected to the Digital Project Management & Control Platform are effectively secured against external and internal threats.

3.2 Documentation / Training / Maintenance

1. Digital Project Management & Control Platform and Software usage and instructional documentation.
2. Training on Digital Project Management & Control Platform functionality and data analytical tools to better facilitate the Clients understanding of all data inputs through the user interface.
3. Upgrading of Digital Project Management & Control Platform software with revisions and maintenance fixes and other applicable upgrades during the service period of the contract
4. On demand technical support/troubleshooting during the service period of the contract

**4. Service Period and Deliverables**

4.1 Service period

The Digital Project Management & Control Platform service of the project is proposed to be commenced on the effective date of the contract, and ended upon the completion and final acceptance of Component A, B and C and a further initial operation phase, with the expected total of 5 years. This service period may be extended further across the operational stages of the project lifecycle depending on the Client’s requirements.

4.2 Schedule for Deliverables

The Digital Project Management & Control Platform services are proposed to be delivered in a number of stages, among them:

* Stage 1 Provide access to the base Digital Project Management & Control Platform, including the Design and BIM model, with effective training for operation and control within two weeks from the effective date of the contract.
* Stage 2 (within 1 month from the effective date of the contract): Complete the requirement analysis for initial data entry of the Digital Project Management & Control Platform and submit the corresponding operating documents and technical instructions requirements to the Client for provision.
* Stage 3 Upload the basic project management and control data of Component A, B, and C to the Digital Project Management & Control Platform within four weeks from the provision of requested data by the client.
* Stage 4 Launch the relevant management and control services of smart construction site for each Component within one month from the date at which the corresponding construction contractor accesses to project site.
* Stage 5 (During the service of the Digital Project Management & Control Platform ): To assist the Client in coordinating the processing and upload into the Digital Project Management & Control Platform of all data provided by the organizations concerned, guiding and assisting them to select solutions that are compatible with the Digital Project Management & Control Platform (through a set of standards), inputting related engineering and management data to the Digital Project Management & Control Platform , and promoting its application in depth. Provide Completion BIM Model for Component A, B and C.
* Stage 6 (within 1 month after the expiration of the service contract): Complete the delivery of all project control data and documentation.
* Stage 7 (within 2 months after the expiration of the service): To provide the software packages, including on-going upgrades and training, to facilitate progression through the remaining lifecycle of the project.

**5. Client’s Input and Counterpart Personnel**

5.1 Services, facilities and property to be made available to the MTP by the Client:

1. The Client will provide in a timely manner, at no cost to the Consultants, the inputs, relevant project data, and reports required for the preparation of the Consultant’s Proposal.
2. The Client or their agents shall provide necessary infrastructure to offer access to the electronic power and network for any hardware equipment established and used in the Digital Project Management & Control Platform.
3. The Client shall provide project related documents including the engineering design drawings and construction organization plans of Component A, B, and C and the required permissions for usage of drones within the confines of the project area for capture of digital images of the project throughout its lifecycle, insomuch as the Client shall retain the Intellectual Property Rights to any of the aforesaid images.

5.2 Professional and support counterpart personnel to be assigned by the Client to the Consultant’s team:

1. The Client shall provide personnel to facilitate the analysis on requirements of project management and control.
2. The Client shall provide personnel to the MTP in support of the implementation of the Digital Platform and the associated advice from the MTP.

**6. Qualification Requirements for the Consultant**

In order to ensure that the delivered Digital Project Management & Control Platform is closely integrated with the actual project, the Consultant shall meet the following qualification requirements:

1) Strong and referential experience in delivering Information and Communication Technologies (“ICT”) in large scale infrastructure projects.

2) Digital Platform Management design expertise; BIM and GIS expertise; Data Security Management expertise.

3) The ability to draw on Construction industry experts (submitting appropriate CVs) in the fields of Project Management, Civil and Structural Engineering, and Environmental Control.

Key expert input from the perspective of engineering and digitalization are required during the development and services of the Digital Project Management & Control Platform. The qualification criteria of key experts will be set forth in the assignment’s RFP.