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BIM Services

**Proposal for BIM Consultancy Study
for Development Bureau**

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Developed By
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Task 1 BIM Requirements for Tender Specifications

Background:

Currently, BIM in Hong Kong are required as “Additional Service” to the traditional professional practice. BIM service providers collect Design professional information and turn into a BIM model during design and construction stages. This practice, however, does NOT contribute to the official Statutory and Contractual significance of a project, nor carry traditional Professional Liabilities.

To improve the situation, there should be changes on both Project Manager (PM) side and consultants / contractor side, which in principle:

- a new role for BIM quality manager and BIM Information manager on PM side
- require integration of BIM workflow on consultant & contractor sides

T1.1 BIM Requirements for QA / QC requirements for Project Manager

- a. To require appointment of BIM Quality Manager (BQM) and / or BIM Information Manager on PM side and set out corresponding qualification criteria
- b. BQM may be HKIA / IE / IS AND HKIBIM professional members.
- c. To devise Employers information requirements (EIR) templates
- d. to devise methodologies to check against EIR
- e. to identify essential deliverables;
- f. to carry out manual spot auditing;
- g. to carry out quality checking procedures & methodology
- h. to devise BIM quality control mechanism to integrate with minimal disruption into current workflow of consultants and contractors.
- i. QA framework for consultants may include:
 - i. Require HKIA / IE / IS as BIM model in-charge
 - ii. Require to submit BIM resources organization chart for vetting and approval (to be assessed based on project scale)
 - iii. Require consultants to generate audit report (provided by Employer) regularly on BIM model and information integrity
 - iv. Require mandatory COBie data drop during design stage
 - v. Carry out regular BIM model integrity meeting
 - vi. Client's BIM Quality Manager to manage and audit check
- j. QA framework for contractors may include:
 - i. Require T3 as BIM supervisors
 - ii. Require to submit BIM resources organization chart for vetting and approval (to be assessed based on project scale). e.g. BIM supervisors for each discipline, no. of BIM modellers, etc.
 - iii. Require contractor to submit BIM model along with traditional submissions.
 - iv. Empower BIM Quality Manager to take part in contractor's submission approval process. E.g. BQM rejects submission if shop drawings and BIM models are drawn separately, CSD not generated from BIM models, etc.

- (i.e. BQM must be professional to be convincing to the management team)
- v. Require approved COBie data drop a pre-requisite for submission approval
- vi. require point-cloud scanning as part of site work before cover ups and formulate part of the completion sign-off process.

T1.2 BIM Requirements for Design Consultancy

Consultant is to develop a BIM Requirements Template for Design Consultancy Service applicable to government's Public works projects carried out by the departments under the Bureau, which includes but not limits to:

- a. Define Employers information Requirements (EIR)
- b. Project Execution Plan
- c. set out team structure requirement ensuring quality BIM implementation for deliverables.
- d. set out minimum no. and qualifications for professionals who are also BIM literate (i.e. BIM Enabled Professionals)
- e. Define ownership and design liability of design models among consultants
- f. Require drawings production directly generated from BIM models, without intentional manual alterations
- g. set out team resources, hardware, software requirements
- h. To identify required and optional BIM applications and deliverables produced using BIM tools, such as,
 - i. Design presentation
 - ii. Tender drawings
 - iii. schedules
 - iv. Statutory submissions
 - v. Analysis,
 - vi. Construction sequence strategy, etc
- i. Common Data Environment (CDE)
- j. To set out BIM model QA procedures
- k. To set out guide to allow for sub-consultancy from BEC / BSP service providers.
- l. To define collaboration methodology and workflows

T1.3 BIM Requirements for Construction Tender

Consultant is to develop a BIM Requirements for Construction Tender Template applicable to government's Public works projects carried out by the departments under the Bureau, which includes but not limits to:

Consultant shall:

- a. minimum no. and qualifications for professionals who are also BIM literate (i.e. BIM Enabled Professionals)

- b. team structure requirement ensuring quality BIM implementation for deliverables.
- c. BIM model ownership and liabilities
- d. Employers Information Requirements EIR
- e. BIM generated deliverables, which may include:
 - i. Fully coordinated construction models
 - ii. Shop drawings
 - iii. Combined services drawings
 - iv. work sequence and progress reporting, etc.
- f. Minimum standard for BIM deliverables, which may include:
 - i. BIM Project Execution Plan (PXP)
 - ii. Common Data Environment (CDE)
 - iii. Intelligent 3D libraries
 - iv. Intelligent 3D models
 - v. 3D based collaboration
 - vi. COBie
 - vii. 3D digital survey / As-built point cloud scanning
 - viii. Final model in both native and open formats
 - ix. Others deliverables for facility management use
- g. Framework and process for quality assurance purpose required
- h. COBie data deliverable and quality assurance
- i. O&M manual / as-fitted drawings digital handling
- j. frequency for BIM review meeting.
- k. BIM collaboration methodology and workflow.
- l. hardware and network requirements
- m. guide and requirements to allow for sub-contracting from BIM service providers.
- n. As-Built level of details / development and format of Information Exchange for Asset Management Specification, including Asset Templates

Task T2 Standard Procurement Procedures

Background:

For the past decade, Hong Kong has no BIM competent cum building professional consultant (i.e. Architects, Engineers & Surveyors, etc) (BIM enabled consultants) to take lead to drive the local BIM development and adoption. Leaving only non-building professionals to drive the market adoption, which often give the market undesirable preconception and downplay BIM as simply a drafting tool.

Possible reason:

- Shortage of these group of people in local market.
- Lack of commercial incentive for existing building professionals to equip themselves with BIM knowledge and know-how.

T2.1 Consultant to establish criteria for assessing whether consultant or the contractor companies are “BIM enabled” for a project tender

Consultant should base on the following criteria for the assessment:

- a. number of BIM enabled professionals, which are
 - i. Professional member of HKIA, HKIE, HKIS, etc or overseas equivalence and
 - ii. Professional member of HKIBIM or equivalence
 - iii. With BIM experience
- b. Their degree of involvement of the BIM enabled professionals
- c. Past BIM project reference
- d. Office BIM implementation plan, policy and in-house implementation incentive
- e. Office BIM project execution plan, BIM workflow and software of choice
- f. Office BIM quality assurance and auditing procedure
- g. Demonstration of competency, illustrated by workflow and process, in project specific required BIM applications
- h. BIM maturity level capabilities (to be in line with Bureau BIM strategy roadmap, taking reference from UK BIM maturity level)
- i. out-sourcing for BIM auditing and / or modelling
- j. Size of company and resources.

T2.2 procurement templates for engagement of BIM enabled consultants and contractors:

Consultant to devise procurement templates for Government contracts for engagement of BIM-enabled consultants and contractors, in form of special conditions in addition to current tender documents, which shall include, but not limited to:

- a. To set out BIM enabled consultants prequalification requirements, in line with BIM competency certification.
- b. To devise formula / mechanism assisting judgement on calculating minimum required number of BEP for each specific project.
- c. To devise scoring sheet to quantify BIM competency of the tendering companies;
- d. To devise Employer's Information Requirements (EIR) document template.
- e. To list out standard tasks for BIM model auditing;

Reference to international standard (e.g. UK BS / PAS) is recommended

Task T3 BIM Project Execution Plan (PXP)

The consultant is to:

- a. Provide Standardized Project Execution Plan which can facilitate Works Departments to set up project team in an effective manner. Local and International References shall be made.
- b. Standardized project templates for different professional disciplines, namely Architecture, Structure, MEP, Civil and QS.

Task T4 BIM Platforms (Optional)

Objectives:

- a. The choice of BIM platform for Government projects is a highly politically sensitive topic. Bureau should avoid giving the market a preconception that the Bureau has pre-determined preference on specific platform(s). To achieve this, it is crucial to demonstrate any choice of platforms for any one specific project is based on informed and transparent decision.
- b. to provide open, common and fair comparison platform for various softwares to showcase their BIM capabilities and their positions in the full picture of the BIM technology.
- c. to provide easy reference for local (and even extended to international in future) BIM practitioners to make informed decisions for choosing BIM tools.
- d. To leverage software providers resources for establish and maintain up-to-date BIM tools comparison matrix by providing them a common competing platform.
- e. To maintain the platform for future continuous use, and possibly attract global attention.

Consultant to devise a common comparison platform to assess the characteristic and functionality for various:

- a. BIM Software/ hardware/ network requirements
- b. Collaboration platform
- c. BIM Federation process

Consultant to establish a comparison matrix of specific deliverables and tasks against common government works stages (e.g. design, construction, as-built and operation phases)

Consultant to select several common and essential tasks from the matrix, set out require specific guidelines and requirements and to invite and co-ordinate various BIM software and platform companies to participate for evaluation.

Consultant to establish assessment criteria for these selected tasks in the form of scoring sheet for the compliance by reviewing the result reviewed, by then to recommend suitable hardware/ software/ network and platform during various phases of the projects.

Consultant to recommend follow up tasks for continuous development of this platform, such as:

- a. To engage contractor to develop web interface for auto accepting software companies' fresh submissions or updates from time to time.
- b. To recommend resources required to maintain the platform
- c. To recommend any vetting mechanisms and scoring criteria for future submissions

Consultancy Programme

	Month											
	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18
Short Term	T1 BIM Requirements for Tender Specifications											
	T2 Standard Procurement Procedures											
Mid term					T3 Project Execution Plan (PXP)							
			T4 BIM Platforms (Optional)									
Long Term	L1 BIM Strategy Roadmap - BIM Level											
	L2 Application Notes / Application of BIM Uses											

Long Term (Separate Consultancy Contract)

Task L1 **BIM Strategy and Road Map** (Suggest a separate consultancy as oppose to Short/Mid Term)

Objective:

- To induce a commercially viable environment for high quality BIM practitioners from all over the world to take part in local BIM related business.
- To define broad term standard in terms of BIM use maturity level, making reference to / adopting BIM maturity level adopted in UK and BS1192:2007 in formulating the road map and strategy for Development Bureau.
- To provide incentives for local active BIM practitioner, especially to SME

The competent BIM Consultant shall possess with **International** BIM implementation policy experience for this task, but must associate with a **Local** Professional BIM Consultant with professional background for local practices.

The consultant is to:

- a. Define objectives, visionary goals, statement and roadmap for the BIM Adoption in DEVB and Works Departments
- b. Define the Team Structure to facilitate the BIM adoption in works projects, e.g. BIM Champion
- c. Survey on the current needs and obstacles of Works Departments
- d. Define the BIM implementation strategies for different types of projects
- e. Define the scope of BIM works in projects (BIM uses) and the implementation strategy
- f. Future ~~integration~~ **collaboration** requirements for e.g. CAD, facility management
- g. Recommendation on workflow and application on existing CAD Standard for Works Project (CSWP) **(Suggest migrating from CAD into BIM system rather and integration within a time. BIM is NOT an upgrade version of CAD)**

Task L2 **Application Notes / Application of BIM Uses**

Consultant to provide interviewer(s) of professional background with construction experience e.g. HKIA/HKIE/HKIS AND HKIBIM professionals to interview the 6 Departments under Development Bureau for their BIM needs, BIM deliverables and BIM Implementations within 2 months.

Consultant to consolidate their BIM requirements and make assessment on the priority of the applications into different categories:

- *Must Do*
- *Optional*
- *Under Development*

Consultant to assist to propose BIM implementation schedule for the applications.

1 Fee Schedule

The fee schedule for the proposed consultancy is outlined in the table below.

Project stage	Fee	Payable on	Project Duration
Project Set up	HK\$ 100,000	Before project start	At start
Task T1 BIM Requirements for Tender Specifications	HK\$ 368,000	30% Completion of documentation T1.1 30% Completion of documentation T1.2 30% Completion of documentation T1.3 10% Upon completion and endorsement	6 months after award of contract
Task T2 Standard Procurement Procedures	HK\$ 288,000	50% Completion of documentation 50% upon completion and endorsement	4 months after award of contract
Task T3 BIM Project Execution Plan (PXP)	HK\$ 238,000	50% Completion of documentation 50% upon completion and endorsement	3 months
Task T4 BIM Platforms (Optional)	HK\$ 288,000	50% Completion of documentation 50% upon completion and endorsement	Start 3 months and complete 8 months after award of contract
Total	HK\$ 1,282,000		

The total duration of the project is commenced from Early May 2017 and ended on 15 Dec 2017.