EXCHANGE INFORMATION REQUIREMENT (EIR)

BIM CONTEST MALAYSIA 2019

Glodon

1. Purpose of document

The intent of this document is to provide an outline definition of Exchange Information Requirements (EIR) to support the implementation of Building Information Modelling (BIM).

This document outlines the following to support collaborative processes and produce the information required during design, construction and handover with the following purposes;

- Responsibilities
- Best practices
- Methods and protocols
- Relevant business processes
- Supporting software requirements
- BIM data requirements

All requirements stated in this document shall be used to support information provided for all consultant and contractor appointments with reference to information deliverables. For further appointments this document may be reviewed and superseded, however core principals such as standards and naming / data structures shall be continued throughout the project in alignment with the wider project objectives.

No part of this document shall be construed as preventing any team member from sharing BIM information if this is to benefit the project progress and co-ordination.

The purpose of this document is to outline the requirement of information exchange specifically for this event (Glodon BIM Contest 2019). This document represents the scenario of specifications of information exchange to an actual project requirement, focusing of the quantity take-off aspect (5D) using tools such as automated software to improve accuracy of quantity estimation in a shorter time frame. This document does not represent a complete EIR and only to simulate for the purpose of this contest, however its template can be useful for those who plan to use it as an initial draft as this document complies to the context and languages of the international standards and other relevant standards for Building Information Modelling.

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Rev No	Revision Date	Author	Approved by	Page No	Sec. No	Brief Description of Change
1	07/8/2019	Ong Wilson				First Draft

2. Project Information

Employer	Glodon Software Sdn. Bhd.
Project name	Construction of X School in the vicinity of X
Short project description	3-storey school building package including excavation & foundation
Project address	X
Correspondence address	X

3. Strategic Priorities

- Project delivery of the highest quality
- Better decision making by <APPOINTING PARTY>
- Earlier and more efficient reporting of developing design information allowing key changes to design to be made earlier, at less cost.
- Visual communication and optimisation of construction phases
- Visual communication and optimisation of construction sequencing
- Improved cost certainty and predictability by using quick and accurate cost estimation tools
- Improved accuracy and consistency of design information
- Improved health and safety on site and during operation
- Models and information which can be used to support operation and maintenance of the facility beyond practical completion
- Asset information delivery of the highest quality
- More efficient visual communication of the design intent as this develops

4. Applicable Reference Standards

The purpose of this section is to define the BIM Standards that are incorporated into the Information Requirements. The core documents and standards that <APPOINTING PARTY> will adopt for its projects are:

- PAS 1192-2:2013/ISO 19650-2:2018
- PAS 1192-3:2014
- BS 1192:2007(A2):2016/ ISO 19650-1:2018
- BS 1192-4:2014
- PAS 1192-5:2015
- PAS 1192-6:2018

5. Technical

This section establishes technical information requirements, including software, data drop contents and Level of Definition.

5.1. Software Platforms

The agreed software for the delivery of the BIM requirements will be listed in the Information Exchange Schedule of the BEP. This list should not be viewed as definitive or restrictive. <APPOINTING PARTY> may request software versions to be updated at any point during this project. Any update or change in software versions is to be agreed by <APPOINTING PARTY> and the project team.

List of agreed software

3D Modelling software and versions required

- Revit 2019

4D Quantity surveying software and versions required

- Glodon Cubicost TAS C 0.6800
- Glodon Cubicost TRB C 1.3888
- Glodon Cubicost TBQ 4.3399
  To generate Bill of Quantities

<APPOINTING PARTY> may define version and software platform when necessary.

The following details of the quantity take-off process should be detailed in the Pre-appointment BIM Execution Plan:

- Associated Software
- Process overview
- Responsibilities
- Outputs
- Proposed workflow and systems for verifying generated and received project data
- Proposed workflow and systems for validating generated and received project data
- Tolerance strategy
- Quantity take-off process
- Verifying quantity take-off queries to the <APPOINTED PARTY> (files and data in place), validating suitability of data content with <APPOINTED PARTY>
- Proposal for quality assurance and liaison with the Client / end users when incorporating PIM data into an Asset Information Model
- How this process will align with the employers contractual and process requirements, such as ongoing / periodic quantity aspect review.

5.2. Data exchange protocols

The use and responsibility, format and frequency of shared information, should be understood by all project team members. It is a key requirement of <APPOINTING PARTY> that asset information developed in the design and construction phases of the programme can be incorporated.

5.3. Asset Information Model (AIM)

To support the development of an AIM, it is mandatory that for each data exchange and at handover, the following information will be provided from the same dataset such as design authoring models to be utilised for design and analytical functions.

5.4. AIM requirements

At handover, <APPOINTING PARTY> requires an asset information model. The data structure which outlines requirements will be further defined in the project BEP following engagement with the FM provider.

The design team are to model the correct elements or systems to enable data to be included at a later point, during the life cycle of the project, in accordance with the model production and delivery table.

5.5. Trial

An initial trial for the exchange of BIM data will help identify any unknown and unique issues with collaboratively exchanging information amongst the appointed project team(s), including model location to reduce any errors or wasted time later in the project.

5.6. Level of Information Need

Requirements for the development of geometrical definition and model usability need to be mapped against project work stages to support the project deliverables and support BIM uses.

These requirements are to be understood by the project team and appointed <APPOINTED PARTY> and incorporated in the Building Information Modelling Execution Plan (BEP). Interpretation and meaning of Level of Information Need.

5.7. Training

<APPOINTING PARTY> is not responsible for providing training with regards to the BIM authoring tools used by <APPOINTED PARTY>. It is a requirement that all individual parties are fully trained on the authoring tools prior to project engagement.

6. Competence

6.1. BIM specific Capability Assessment for Appointed Party

<APPOINTED PARTY> will be assessed based on their response to the Capability Assessment Form (CPIx Assessment form), as well as the submission of proposals through a BEP to meet the BIM Objectives.

6.2. Knowledge and Skill Requirements

6.2.1. BIM Objectives and Processes

<APPOINTED PARTY> shall demonstrate knowledge of the underlying processes required to support BIM uses. This will involve communicating and recording intended methodology which should be shared with the BIM leader for confirmation prior to implementation.

All project team members are responsible for procuring training within their own organisation, and are required to undertake sufficient training to efficiently meet the requirements of the project.

6.3. Software

Experience, knowledge and skill of the appointed <APPOINTED PARTY> must be sufficient to competently undertake processes required to achieve the required BIM uses.

If <APPOINTED PARTY> fail to meet these requirements they will improve skill sets or recruit additional technical staff before implementing processes.

Suggested training

Glodon software training

6.4. Resource Requirements

6.4.1. Hardware and Technology

Team members are required to utilise workstations which meet system and software requirements of the BIM software tools required.

For Glodon Cubicost, requires a minimum specification of;

1. 8Gb RAM
2. Nvidia GTX 1000 series equivalent & above
3. i5 or i7 processor
4. 64 bit system

7. Management

7.1. Planning of work and data segregation

Information should be managed in accordance with the processes described in PAS 1192-2:2013/ISO 19650-2:2018, PAS1192-3:2014, BS1192-4:2014 and BS 1192:2007(A2):2016 with use of the work stages detailed in "Plan of Work" (ISO 19650-2:2018).

The <LEAD APPOINTED PARTY> is to work with <APPOINTING PARTY> to establish project segregation. The agreed approach is to be documented in the Building Information Modelling Execution Plan (BEP).

Each originating <APPOINTED PARTY> should develop and fully understand the method for developing BIMs to coordinate and support the outputs required. It is advised that models are segregated into multiple linked models, and the strategy for this is to be incorporated into the project Building Information Modelling Execution Plan (BEP).

7.2. Roles and responsibilities

A Master Information Delivery Plan must be included within the BEP identifying what and when geometrical and alphanumerical information is required and who is responsible.

General design coordination is the responsibility of the BIM Leader. Should the design team be novated, it will be their responsibility from that point onwards to execute and coordinate the design under a novation agreement, whilst the Contractor's responsibility will be to deliver the coordinated design after novation.

All stakeholders shall utilise BIM information distributed via the Common Data Environment (CDE) to validate the BIM at key project stages. The following should be reported to the BIM Leader immediately upon discovery: of discrepancies in the model which may cause inaccuracies or/and instances where out of date information is contained within any of the information models.

7.3. Document naming protocol

Model naming conventions should be in accordance with BS 1192:2007(A2):2016/ BS EN 19650-2:2018 with the relevant suitability and revision codes.

Eg.

PR1-XYZ-V1-03-CR-Z-0001-S0-P1

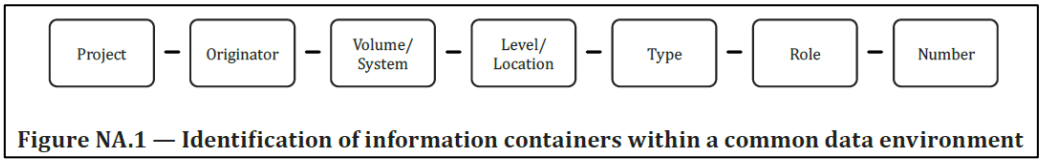

Figure NA.1 — Identification of information containers within a common data environment

7.4. Common data environment (CDE)

<APPOINTING PARTY> is responsible for storing and maintaining a copy of all project information in a secure stable location within their own organisation and will make information available to the project team over the Common Data Environment (CDE). The <APPOINTING PARTY> will have access to native and exchange BIM files at any point.

The Common Data Environment (CDE) for this project, file naming and location structure will be confirmed within the Building Information Modelling Execution Plan (BEP). The folder structure within the Common Data Environment (CDE) will be in line with that detailed in PAS1192-2:2013.

The Common Data Environment (CDE) platform that will be used is GoogleDrive, as a means of exchanging information and other data.

Example of CDE management:

Original design of the model will be placed in the Published area (status code, D1 – suitable for costing) for generation of Bill of Quantities. Once quantity take-off has been undertaken, this information shall be stored in shared area with suitability code of S2 to determine its suitable for information.

7.5. Mobilisation Plan

Mobilisation plan shall be detailed once appointment has been awarded to the respective appointed parties.

Contractors may use tools such as Glodon Cubicost Suite of programmes to determine variation of quantity and to track progress of project versus cost estimation at given time.

7.6. Information delivery Risk Assessment

Each prospective lead appointed party is responsible in conducting an information delivery risk assessment.

8. Commercial

8.1. BIM Execution Plan

The <APPOINTED PARTY> shall prepare, deliver and maintain a BIM Execution Plan (BEP) for the project that responds to this Exchange Information Requirements.

The <APPOINTED PARTY> shall review their BEP regularly and additionally when there is any change to their contract.

Pre and Post Building Information Modelling Execution Plans are to be provided in response to the Exchange Information Requirements identifying the <APPOINTED PARTY> proposals clause by clause. The Pre-appointment BIM Execution Plan will be scored as part of the tender submission.

8.2. BIM Specific Competence Requirements

This section details the information that a bidder should be required to provide as part of a bid submission, to demonstrate BIM capacity and experience.

Responses will need to describe how mature an organisation is, and what capabilities are held specifically where this is in accordance with the standards sighted in this EIR.

Tenderers should include the following detail:

- Approach to BIM – organisational culture with regards to BIM
- BIM experience – organisational capability and personnel. Level of skill and competency
- BIM capabilities – examples of previous projects delivered in accordance with the standards sighted in this EIR
- Security understanding, capability, competence and experience
- Out-sourced roles – any BIM related roles which are outsourced

8.3. Confirmation of BIM Toolset

Responses will describe the processes and procedures that make up the bidder's BIM and information management toolkit specifically where this is in accordance with the standards cited in this EIR

Tenderers should include the detail on procedures aligned with core project stages as follows:

- BS 1192:2007(A2):2016/ ISO 19650-1:2018
- PAS 1192-2:2013/ ISO 19650-2:2018
- PAS 1192-3:2014
- BS1192-4:2014
- Other bespoke processes and technical tools

The information requested in this section is detailed further in PAS 1192-2:2013.

9. Glossary of Abbreviations and Terms

9.1. Abbreviations

BEP	BIM Execution Plan
BIM	Building Information Modelling
CDE	Common Data Environment
EIR	Employer Information Requirement
IFC	Industry Foundation Classes
LOD	Level of Detail
LOI	Level of Information
MPDT	Model Production Delivery Table
WIP	Work In Progress

9.2. Glossary of Terms

4D	A 3D representation of an asset with the element of time included to enable simulations.
5D	A 3D representation of an asset with the element of time and cost included to enable simulations, commercial management and earned value tracking to take place.
Asset Information Model (AIM)	All the information that is needed to support the management and operation of the built asset (infrastructure or building). This can be formed partly from the PIM at the handover stage of a project. It differs from the PIM in that it consists only of the information that is needed to support the management and operation of the asset. The AIM will continually be updated and developed throughout the life of the asset as information is fed into the model during the asset's management.
Building information modelling execution plan (BEP)	Broken up into pre and post-appointment outputs, this document defines how the project's information management will be carried out by the delivery team relating directly to the project's EIR. It includes, amongst other things, who is responsible for providing information, what the processes will be, and provides common terminology to be adopted as well as job titles and responsibilities within the delivery team.

Building information modelling (BIM)	Process of designing, constructing or operating a building or infrastructure asset using electronic object-oriented information
Built Asset Security Strategy (BASS)	The Built Asset Security Strategy should be developed for the lifecycle of a given built asset and should determine the relevant security requirements and associated risks as well as the strategy to mitigate these risks through a Built Asset Risk Management Plan. This should inform any OIRs (PAS 1192-3) and/or project's information requirements developed.
Built Asset Security Management Plan (BASMP)	Following on from the BASS, the Built Asset Security Management Plan should be developed which identifies how a holistic approach is to be implemented in practice against the specific security risks, or combinations of risks, identified within the BASS.
Built Asset Security Information Requirements (BASIR)	Following on from the BASMP, the Built Asset Security Information Requirements shall be defined which identifies what specific information is needed to be produced and managed in order to meet the holistic approach defined within the BASMP. Details on the requirements on how information for a specific built asset should be generated, stored, disseminated and used should also be outlined. This should inform any AIRs (ISO 19650/PAS 1192-3) and/or EIRs (ISO 19650-2) developed.
COBie (Construction Operation Building information exchange)	A spreadsheet data format that contains digital information about maintainable assets in as complete and as useful a form as possible. This spreadsheet has a pre-defined structure that is used to both store and index information transferred within the CDE. A COBie file contains only information that is needed and is stored in such a way that the recipient knows exactly where to find any given information (allowing automation of this process).
Common data environment (CDE)	A single source of information for any given project or asset, used to collect, manage and disseminate all relevant approved project/asset information. Stored digitally, this is where information is shared collaboratively in a logical and accessible way to help all key parties readily gain access to information, using universal naming conventions, avoiding duplication and retaining ownership.
Data	Information stored but not yet interpreted or analysed
Design intent model	Initial version of the project information model (PIM) developed by the design <APPOINTED PARTY>

Delivery Team's Risk Register	This details the delivery team's risk associated with the timely delivery of information deliverables in accordance with the appointing party's EIR. Considered risks include (amongst others), meeting the information delivery milestones and adoption of the project's information Standard.
Document	Information for use in the briefing, design, construction, operation, maintenance or decommissioning of a construction project, including but not limited to correspondence, drawings, schedules, specifications, calculations, spread sheets
Drawing	Static, printed, graphical representation of part or all have a project or asset
Appointing Party	Individual or organization named in an appointment or building contract as the employer
Exchange information requirements (EIR)	Pre-tender document setting out the information to be delivered, and the standards and processes to be adopted by the appointed party as part of the project delivery process
Graphical data	Data conveyed using shape and arrangement in space
Level of Information Need	Collective term used for and including "level of model detail" and the "level of information detail". Described within the OIR, PIR, AIR and EIR, the level of information need defines the granularity of both graphical and alphanumerical information of an information deliverable. This should be defined as the minimum granularity to avoid over-production of information leading to waste and so consideration should be made on the purpose of any produced information.
Master information delivery plan (MIDP)	Primary plan for when project information is to be prepared, by whom and using what protocols and procedures, incorporating all relevant task information delivery plans
Pre-appointment BEP	The pre-appointment BEP is to demonstrate the Appointed party's proposed approach, capability, capacity and competence to meet the EIR. It is utilised prior to the appointment of any stakeholder.

Post-appointment BEP	The post-appointment BEP is the document defining standard methods and procedures adopted during the appointment in order to meet the objectives and requirements set forth in the EIR. It is utilised following the appointment of project stakeholders and in particular the main contractor.
Project implementation plan (PIP)	Statement relating to the <APPOINTED PARTY> IT and human resources capability to deliver the EIR
Project Information Model (PIM)	This is the term for the information (graphical, alphanumerical, documentation) which is developed during the design/construction phase of the project. Information that forms the PIM is created by the project team and sits within the CDE. As the project develops so too will the PIM, which will increase in both size and accuracy; starting as a design intent model progressing to an as-built model after construction is complete.
Standard method and procedure (SMP)	Set of standard methods and procedures covering the way information is named, expressed and referenced
Security Breach/Incident Strategy (SB/IMP)	The Security Breach/Incident Management Plan forms part of the BASMP and should provide detail on how and the impact of failure and/or disruption is minimized ensuring business continuity is maintained and the security is upheld.
Task Information Delivery Plan (TIDP)	Task Information Delivery Plans are produced for/by each task team from their viewpoint. They are collated into the Master Information Delivery Plan and are based on the deliverables as agreed within their contract.
Federation Strategy	Manageable spatial subdivision of a project, defined by the project team as a subdivision of the overall project that allows more than one person to work on the project models simultaneously and consistent with the analysis and design process