

# BIM Contract Conditions

Conditions of Contract for Building Information Modelling (BIM)

The Hong Kong Institute of Surveyors

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### **Feedback**

It is expected that as more organisations will adopt BIM and digital technologies, these BIM Contract Conditions will undergo an evolutionary process. The Hong Kong Institute of Surveyors welcomes comments and proposed changes to this publication and thus encourages readers to notify us of any apparent inaccuracies or ambiguities for further improvements in the subsequent revision.

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## Conditions of Contract for Building Information Modelling (BIM)

### 1. Definitions

- 1.1 The following words and expressions in these Conditions of Contract for Building Information Modelling shall have the meanings given below except when the context otherwise requires:
- 1.1.1 **Agreement** means the agreement between the Employer and the Project Participant named in Appendix 1, to which these BIM Contract Conditions are attached or incorporated.
  - 1.1.2 **Architect** means the party named as the Architect (or the Supervising Officer) in the Agreement.
  - 1.1.3 **Building Information Modelling (or BIM)** means the technology and process used to create the Building Information Model.
  - 1.1.4 **Building Information Model (or Model)** means the digital representation of physical and functional characteristics of the whole or part of the Project, and includes a Model Element, a single model or multi-model used together and other data identified in Appendix 2.
  - 1.1.5 **BIM Contract Conditions** means these Conditions of Contract for Building Information Modelling including their Appendices 1 and 2.
  - 1.1.6 **BIM Execution Plan** means the document prepared by the identified project participant to describe how to implement the BIM aspects of the Project.
  - 1.1.7 **BIM Manager** means the person or entity appointed by the Employer, Project Participant or other project participant to perform the Digital Data and BIM management role for the Project.
  - 1.1.8 **Contractor** means the project participant responsible for designing (where applicable), carrying out and completing the whole or part of the Project.
  - 1.1.9 **Contribution** means the data, information, detail or design created or prepared by the Project Participant, and shared with other project participants through or in connection with the Model.
  - 1.1.10 **Coordinated Model** means the Model prepared by the Design Consultant or the Contractor to coordinate various discipline-specific Models before commencement of the relevant construction work.
  - 1.1.11 **Design Consultant** means the project participant responsible for the design of the whole or part of the Project.
  - 1.1.12 **Design Model** means a discipline-specific Model prepared by the Design Consultant or his sub-consultant to show and describe the architectural, structural, mechanical, electrical, plumbing or other design requirements of the Project.

- 1.1.13 **Digital Data** means information including Models, drawings, details, schedules, specifications, unpriced bills of quantities or schedules of quantities and rates and any other contract documents, instructions, certificates, programmes, daily reports, progress photographs and any other communications created or stored in digital form in relation to the Project.
- 1.1.14 **Employer** means the party named as the Employer in the Agreement.
- 1.1.15 **Employer's Information Requirements** (or **EIR**) means the document attached to these BIM Contract Conditions at Appendix 2, specifying the Model and Digital Data to be produced, delivered and used by the Project Participant, including its standards, procedures and processes.
- 1.1.16 **Intellectual Property Rights** (or **IPR**) means trademarks, patents, copyrights, design rights, trade names, new inventions, designs or processes, and other intellectual property rights of whatever nature and wheresoever arising, whether now known or hereafter created, and whether registered or unregistered.
- 1.1.17 **Level of Development** (or **LOD**) means the completeness of the Model at various Project stages specified in the Model Delivery Table.
- 1.1.18 **Model Element** means a part of the Model, which represents a building element, component, system or assembly within the Project.
- 1.1.19 **Model Delivery Table** means the table attached to these BIM Contract Conditions at Appendix 1, specifying the Model Element, the responsible model element author and the corresponding Level of Development at each project stage.
- 1.1.20 **Project** means the project referred to in the Agreement and for which the professional services or construction works are performed or carried out under the Agreement.
- 1.1.21 **Project Participant** means the signing party to the Agreement, excluding the Employer.
- 1.1.22 **Shop Model** means the Model developed from the design intent and prepared by the Contractor or his sub-contractors and suppliers to show his conformity with the design requirements of the Project.

## 2. General Provisions

- 2.1. These BIM Contract Conditions set out the obligations, responsibilities and liabilities of the Employer and the Project Participant related to the production of the Model and its subsequent uses, including the transmission, exchange, storage and archiving of the Digital Data and Model on the Project.
- 2.2. These BIM Contract Conditions shall form part of the Agreement as special conditions of contract or supplemental agreement stated in Appendix 1.
- 2.2.1 Where these BIM Contract Conditions are incorporated into the Agreement as special conditions of contract, the Project Participant shall be deemed to have allowed in the Agreement for all services described in these BIM Contract Conditions.

- 2.2.2 Where these BIM Contract Conditions are executed as a supplemental agreement after the award of the Agreement, the Employer and the Project Participant shall negotiate and agree any adjustments to the original consultancy fee or contract sum and/or the contract period as appropriate, as stated in Appendix 1.
- 2.3 Whenever the Employer shall enter into any other agreements utilising BIM on the Project, the Employer shall arrange to incorporate substantially the same terms as these BIM Contract Conditions into such agreements to enable other project participants to comply with these BIM Contract Conditions.
- 2.4 Whenever the Project Participant shall enter into any sub-contracts utilising BIM on the Project, the Project Participant shall arrange to incorporate substantially the same terms as these BIM Contract Conditions into such sub-contracts to enable his sub-consultants, sub-contractors and suppliers to comply with these BIM Contract Conditions.
- 2.5 Nothing in these BIM Contract Conditions shall relieve the Project Participant's obligations, responsibilities and liabilities as the Design Consultant, Contractor or other role under or in connection with the Agreement.
- 2.6 Except in design-and-build contract or to the extent that the Agreement expressly requires the Contractor to design based on the Design Consultant's design intent or other requirements, the Contractor's participation in BIM shall not constitute provision of design services.

### **3. Priority of Contract Documents**

- 3.1. In the event of any inconsistency or conflict between these BIM Contract Conditions and the Agreement, these BIM Contract Conditions shall prevail unless otherwise stated in Appendix 1.
- 3.2 For the purpose of carrying out and completing the Project, the order of precedence of the relevant contract documents forming part of, or prepared under, the Agreement or these BIM Contract Conditions shall be as follows<sup>1</sup>:
- (a) Contract drawings referred to in the Agreement,
  - (b) Specification referred to in the Agreement,
  - (c) Design Model prepared by the Design Consultant and his sub-consultants,
  - (d) drawings and data extracted from the Design Model,
  - (e) other drawings prepared by the Design Consultant and his sub-consultants separately from, and not extracted from, the Design Model,
  - (f) Coordinated Model prepared by the Design Consultant or the Contractor, and

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<sup>1</sup> *The order of precedence may be amended as appropriate to meet the particular requirement of the Project.*

(g) Shop Model developed by the Contractor and his sub-contractors and suppliers according to the Design Consultant's design intent drawing or Model.

3.3 The Project Participant may rely upon the accuracy and completeness of data in the Model to the extent consistent with the minimum data required for the applicable Level of Development and project stage as specified in the Model Delivery Table.

#### **4. Obligations of the Project Participant**

4.1 Pursuant to Appendix 2, the Project Participant shall:

- (a) produce the Model Elements to the Level of Development and at the project stage identified in the Model Delivery Table at Appendix 1;
- (b) utilise the Models and other digital data produced by himself or other project participants to perform the additional modelling activities or uses identified in Appendix 1; and
- (c) comply with all specified standards, processes and procedures in respect of the development, use, transmission, exchange, storage and archiving of the Digital Data.

4.2 The Project Participant shall immediately inform the Architect and the BIM Manager in writing if he finds any ambiguities or discrepancies in or between any Models and any contract documents forming part of the Agreement, regardless of the project stage or Level of Development. The Architect and the BIM Manager shall facilitate resolution of the ambiguity or discrepancy as soon as practicable after receipt of the notice from the Project Participant. If considered appropriate, an instruction may be issued by the Architect in accordance with the Agreement.

4.3 The standard of care regarding the Project Participant's obligations under Clause 4.1 shall be in accordance with the Agreement and, if not stated, shall be of the skill, care and diligence to be expected from a competent person experienced in carrying out work of a similar scope, nature and size to the Project.

#### **5. Digital Data Exchange**

5.1 Unless otherwise stated in Appendix 1, an internet-based centralised electronic document management system shall be used for sharing and storing the Digital Data under a common data environment for the Project. The Employer or the BIM Manager identified in Appendix 1 shall be responsible for establishing, hosting, managing and maintaining such document management system, including paying all relevant costs and expenses.

5.2 The Project Participant shall continuously use his best endeavours to protect his Digital Data from any cyber risks including, but not limiting to, electronic security breaches, unauthorised acts, virus attacks, hacking and information loss and/or damage. The Project Participant shall regularly back up and store his Digital Data of the Project in a secure and stable system. The Project Participant shall bear all consequences due to his failure to comply with this Clause.



- 5.3 Without prejudice to the Project Participant's obligations under Appendix 2, the Project Participant shall not warrant that the software used is compatible with any software used by the Employer or other project participants in connection with the Project.
- 5.4 The Project Participant shall not be liable for any corruption or unintended modification of the Digital Data which occurs after it has been properly transmitted to the centralized electronic document management system by the Project Participant, except where such corruption or modification is due to his failure to comply with the standards, processes and procedures for transmission, use, storage and archiving of the Digital Data.

## **6. Project Participant's BIM Team**

- 6.1 The Project Participant and each of other project participants shall establish and maintain his BIM team for the satisfactory fulfilment of his obligations under these BIM Contract Conditions. The BIM team shall include sufficient and technically competent resources, having regard to the scale and complexity of the Project, to properly execute and complete the specified BIM tasks and deliverables on time.
- 6.2 The BIM team shall be headed by an experienced and competent BIM team leader who shall be responsible for the management of all BIM tasks within his team. He shall also serve as the main point of contact with the Architect and other project participants for BIM related issues.
- 6.3 Where necessary, the Project Participant may engage a BIM sub-consultant or sub-contractor with suitable expertise for the execution of BIM tasks. The Employer's written approval must be obtained prior to entering into a formal engagement.
- 6.4 The Project Participant shall submit the organisation chart and qualification and experience of the BIM team leader and members for the Employer's approval within 14 calendar days after the award of the Agreement or after the execution of the supplemental agreement stated in Appendix 1.

## **7. BIM Manager**

- 7.1 The Employer, the Project Participant or other project participant(s) identified in Appendix 1 shall be responsible for the appointment of the BIM Manager for the specified project stage or the whole Project. He shall also be responsible for paying all costs and expenses in connection with the appointment of the BIM Manager.
- 7.2 Where the BIM Manager shall be appointed by the Project Participant or other project participant(s), the responsible project participant shall appoint a competent BIM professional or, if allowed by the Employer as indicated in Appendix 1, assign his BIM team leader to act as the BIM Manager. He shall submit the qualification and experience of the BIM Manager for the Employer's approval within 14 calendar days after the award of the Agreement or after the execution of the supplemental agreement stated in Appendix 1.

- 7.3 The BIM Manager shall, in compliance with Appendix 2, be responsible for the overall management of the Digital Data and BIM process for the Project including:
- (a) establishing, hosting, managing and maintaining the centralised electronic document management system unless directly undertaken by the Employer,
  - (b) formulating the standards, methods and procedures for transmission, use, storage, retrieval, exchange and archiving of the centralised Digital Data,
  - (c) providing guidance to all project participants in developing the BIM Execution Plan(s), scrutinising the submitted BIM Execution Plan(s), determining any disagreements over its modifications, and monitoring its proper execution,
  - (d) monitoring the creation and use of Model Elements and other deliverables specified under Clauses 4.1 (a) and 4.1 (b) in compliance with the specified standards, methods and procedures,
  - (e) assisting the Architect in resolving any ambiguities or discrepancies reported under Clause 4.2,
  - (f) carrying out quality checking of the Digital Data stored in the centralised electronic document management system to validate compliance with the specified standards, methods and procedures, and advising the Architect, Project Participant and relevant project participant(s) on any non-compliances, and
  - (g) executing other necessary project information management tasks described in Appendix 2.
- 7.4 Where the BIM Manager is found to be incompetent to fulfil his duties, the Employer may replace his appointment or instruct the responsible project participant to replace his appointment as appropriate.
- 7.5 Upon written request by the Employer or his successor at any times or upon completion of the Project, the BIM Manager shall unconditionally transfer to the Employer or his successor BIM Manager all Digital Data and other tangible and intangible properties in the BIM Manager's possession, custody or control in relation to the Project.

## **8. BIM Execution Plan**

- 8.1 In consultation with other project participants that have then been identified, the Project Participant or other project participant(s) identified in Appendix 1 shall be responsible for the preparation of a BIM Execution Plan for the specified project stage or the whole Project.
- 8.2 After obtaining a mutual agreement of all project participants, the responsible Project Participant shall submit the BIM Execution Plan to the Employer and the BIM Manager within 30 calendar days after the award of the Agreement or after the execution of the supplemental agreement stated in Appendix 1. No approval by the Employer of the BIM Execution Plan shall relieve the Project Participant and other project participants' responsibility in complying with these BIM Contract Conditions.

- 8.3 The responsible project participant, together with other project participants, shall also regularly review, modify and update, where necessary, the BIM Execution Plan, particularly when there is a new project participant utilising BIM on the Project or a change in BIM uses instructed by the Architect.
- 8.4 Where the BIM Execution Plan shall require any modification, it shall be modified by the mutual agreement of all affected project participants. In the event of any disagreement over the modification to the BIM Execution Plan, the BIM Manager is authorised to make the final decision, save for those decisions that shall involve any changes in the scope of services under these BIM Contract Conditions or any variations under the Agreement.

## **9. Use of the Model**

- 9.1 The Project Participant shall be responsible for his Contribution he makes to any Models. The Project Participant shall also be responsible for his own design and/or work he develops by relying on other project participant's Model.
- 9.2 The Project Participant shall be obliged to avoid any risks arising out of the use of, or access to, his Model, including promptly reporting any errors, discrepancies, omissions or incompleteness that he may find in his own Model or other project participant's Model.
- 9.3 The Project Participant shall be deemed to have allowed for amending or updating his Model and required BIM uses from time to time as a result of whatever changes arising from, but not limiting to, design development, design and construction coordination, clash detection and variations.

## **10. Intellectual Property Rights of the Model**

- 10.1 The Project Participant warrants that he owns the Intellectual Property Rights to his Model or is licensed or authorised by other Intellectual Property Rights owner to make his Model. The Project Participant shall be deemed to have paid the costs of any licence fee, royalty or other sum legally demandable for incorporating the Intellectual Property Rights in making his Model.
- 10.2 The Project Participant's and the Employer's Intellectual Property Rights in any Model created by the Project Participant for the Project shall be governed by the Agreement and, if not stated, shall be determined in accordance with applicable laws.
- 10.3 Where the Intellectual Property Rights in the Model shall remain vested in, and belong to, the Project Participant in accordance with Clause 10.2, the Project Participant shall be deemed to have granted to the Employer and the subsequent owners of the Project, their successors in title and assignees, free of any fees, a non-exclusive irrevocable licence to use such Intellectual Property Rights for the Project, including the right to grant sub-licences to other project participants to enable them to fulfil their obligations under these BIM Contract Conditions. No prior written consent from the Project Participant shall be required for such use by the Employer and other project participants.

- 10.4 The Employer shall grant to the Project Participant, where necessary, and other project participants a non-exclusive licence or sub-licence to transmit, copy and use the Model solely for the Project, including the right to grant sub-licence or sub-sub-licence on identical terms to Project Participant's sub-consultants or sub-contractors. The licence, sub-licence or sub-sub-licence granted shall not include the right to amend or modify the Model without the written consent of the originating project participant, save where such amendment or modification is permitted under Appendix 2.
- 10.5 Subject to Clauses 10.1 to 10.4, no act by any project participants shall limit, transfer, deprive, dispossess or otherwise affect any Intellectual Property Rights that the Project Participant owns in respect of his Contribution or Model. When the Project Participant makes a Contribution that may be connected with other project participant's Model, the Project Participant, while owning the Intellectual Property Rights of his distinct individual Contribution, shall not be a co-author or co-owner of that connected Model.
- 10.6 After completion of the Project, all licences granted under Clause 10.4 shall be limited to retaining a copy of the Project Participant's own and related Models solely for record purposes only.

## **11. Indemnity**

- 11.1 The Project Participant shall be liable for and shall fully indemnify the Employer and other project participants from and against any claims, proceedings, costs, losses, damages and expenses arising out of, or in relation to, his infringement or alleged infringement of Intellectual Property Rights contained in his Model, or his unauthorised modification to, or use of, other project participant's Model.

## **12. Termination, Rescission or Expiry of the Agreement**

- 12.1 In the event of termination, rescission or expiry of the Agreement, Clauses 1, 2, 3, 10 and 11 of these BIM Contract Conditions shall continue to apply.

## Appendix 1 – Contract Particulars<sup>2</sup>

### Clause 1.1.1

1.1 The Employer and the Project Participant involved in these BIM Contract Conditions are: \_\_\_\_\_ (Name of the Employer) and \_\_\_\_\_ (Name of the Project Participant).

### Clause 2.2

1.2 These BIM Contract Conditions form part of the Agreement as special conditions of contract / supplemental agreement.

### Clause 2.2.2

1.3 By incorporating these BIM Contract Conditions as supplemental agreement to the Agreement, the revised consultancy fee or contract sum and the contract period are agreed to be HK\$ \_\_\_\_\_ and \_\_\_\_\_ days, respectively.

### Clause 3.1

1.4 In the event of any conflict or inconsistency, the following clause(s) of these BIM Contract Conditions shall not prevail over the Agreement: (e.g. Clause 1.1.16 – Definition of the Intellectual Property Rights).

### Clause 4.1(a)

1.5 The Model Delivery Table is as follows:

Model Element	Project Stage											
	Conceptual Design		Schematic Design		Design Development		Contract Documentation		Construction		Close-out / Record Deliverables	
	LOD	MEA	LOD	MEA	LOD	MEA	LOD	MEA	LOD	MEA	LOD	MEA
(e.g.												
Substructure												
Foundations												
Basement construction												
Shell												
Superstructure												
Exterior enclosures												
Roofing												
Interiors												
Interior construction												
Stairs												
Interior Finishes												
Services												
Conveying												
Plumbing												
HVAC												

<sup>2</sup> Fill in or delete as appropriate.

Model Element	Project Stage											
	Conceptual Design		Schematic Design		Design Development		Contract Documentation		Construction		Close-out / Record Deliverables	
	LOD	MEA	LOD	MEA	LOD	MEA	LOD	MEA	LOD	MEA	LOD	MEA
<i>Fire protection</i>												
<i>Electrical</i>												
<i>Communications</i>												
<i>Electronic safety &amp; security</i>												
<i>Integrated automation</i>												
<i>Equipment &amp; Furnishing</i>												
<i>Equipment</i>												
<i>Furnishings</i>												
<i>Special Construction &amp; Demolition</i>												
<i>Special construction</i>												
<i>Selective demolition</i>												
<i>Building Sitework</i>												
<i>Site preparation</i>												
<i>Site improvements</i>												
<i>Utility services</i>												
<i>Other site work)</i>												

Notes for the Model Delivery Table:

- The project stage is based on the     (e.g. Project Management Institute)    . Alternatively, the Employer may define project stages based on the specific requirement of the Project.
- The classification system for classifying Model Elements is based on the (e.g. UniFormat or OmniClass). Alternatively, the Employer may classify Model Elements based on the specific scope of modelling.
- The Level of Development (LOD) is defined in accordance with the (e.g. Building Information Modelling Standards published by the Hong Kong Construction Industry Council / Level of Development Specification published by the US BIMForum).
- Identify (1) the Level of Development for each Model Element at the end of each project stage, and (2) the Model Element Author (MEA) responsible for developing and authorising the Model Element to the Level of Development identified.
- Insert abbreviations for each Model Element Author identified in the above Model Delivery Table as follows:

Model Element Author (MEA)	Abbreviation	Model Element Author (MEA)	Abbreviation
<i>e.g. Architect</i>	<i>A</i>	<i>Landscape Architect</i>	<i>LA</i>
<i>Structural Engineer</i>	<i>SE</i>	<i>Facade Consultant</i>	<i>FC</i>
<i>Mechanical Engineer</i>	<i>ME</i>	<i>Contractor</i>	<i>C</i>
<i>Plumbing Engineer</i>	<i>PE</i>	<i>Etc.</i>	
<i>Fire Engineer</i>	<i>FE</i>		
<i>Electrical Engineer</i>	<i>EE</i>		

- The deliverables of the Model Elements at each Project Stage are specified in detail in Appendix 2.

**Clause 4.1(b)**

1.6 The additional modelling activities or uses are as follows:

Additional Modelling Activities or Uses	Responsible Project Participant	Required (Yes/No) at the following Project Stages		
		Feasibility and Planning	Design	Construction
<i>e.g.</i>				
1. <i>Design authoring</i>	<i>All design consultants</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>
2. <i>Design reviews</i>	<i>All design consultants</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>
3. <i>Drawing generation / production</i>	<i>All project participants</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>
4. <i>Existing conditions modelling</i>	<i>Architect/Contractor</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>
5. <i>Site analysis</i>	<i>Architect</i>	<i>No</i>	<i>Yes</i>	
6. <i>Spatial and material design models</i>	<i>Architect</i>		<i>No</i>	
7. <i>Design visualisation for functional analysis</i>	<i>Architect</i>	<i>No</i>	<i>No</i>	<i>No</i>
8. <i>Sustainability evaluation</i>	<i>Architect and Building Services Engineer</i>	<i>No</i>	<i>No</i>	<i>No</i>
9. <i>3D design coordination and clash detection</i>	<i>All design consultants</i>		<i>Yes</i>	<i>Yes</i>
10. <i>Building plan checking</i>	<i>Architect</i>		<i>No</i>	
11. <i>Visualisation models for sale and lease</i>	<i>Architect</i>			<i>No</i>
12. <i>Structural analysis</i>	<i>Structural Engineer</i>		<i>No</i>	
13. <i>Wind analysis</i>	<i>Structural Engineer</i>		<i>No</i>	
14. <i>Energy analysis</i>	<i>Building Services Engineer</i>		<i>No</i>	<i>No</i>
15. <i>Lighting analysis</i>	<i>Building Services Engineer</i>		<i>No</i>	
16. <i>Fire engineering</i>	<i>Building Services Engineer</i>		<i>No</i>	
17. <i>Quantity take-off and cost estimating</i>	<i>Quantity Surveyor</i>		<i>Yes</i>	<i>Yes</i>
18. <i>Cash flow forecasting</i>	<i>Quantity Surveyor</i>		<i>No</i>	<i>No</i>
19. <i>3D construction coordination</i>	<i>Contractor</i>		<i>Yes</i>	<i>Yes</i>
20. <i>Construction system design</i>	<i>Contractor</i>			<i>No</i>
21. <i>Site utilisation planning</i>	<i>Contractor</i>			<i>Yes</i>
22. <i>Digital fabrication</i>	<i>Contractor</i>		<i>No</i>	<i>Yes</i>
23. <i>Construction scheduling and sequencing (4D)</i>	<i>Contractor</i>		<i>Yes</i>	<i>Yes</i>
24. <i>As-built modelling for facilities management</i>	<i>Contractor</i>			<i>Yes</i>
25. <i>Etc.</i>				

Note for additional modelling activities or uses:

1. Describe the additional modelling activities or uses, identify the responsible project participants, and state whether the BIM uses are required (Yes) or not required (No) at the specified project stages.

**Clause 5.1**

1.7 A centralised electronic document management system shall be used / shall not be used on the Project and, if used, the platform and software to be utilised shall be

\_\_\_\_\_.

1.8 The Employer / BIM Manager shall be responsible for establishing, hosting, managing and maintaining the centralised electronic document management system.

**Clause 7.1**

1.9 The Employer or project participant(s) responsible for the appointment of the BIM Manager(s) at various project stages is/are as follows:

<u>Responsible Project Participant</u>	<u>Project Stage</u>
<u><i>e.g. Architect</i></u>	<u><i>Planning and design stages</i></u>
<u><i>Contractor</i></u>	<u><i>Construction and close-out stages</i></u>

1.10 The Employer shall allow / shall not allow the Project Participant's BIM team leader to act concurrently as the BIM Manager.

**Clause 8.1**

1.11 The following project participant(s) shall be responsible for the preparation of the BIM Execution Plan for the following project stage(s):

<u>Responsible Project Participant</u>	<u>Project Stage</u>
<u><i>e.g. Architect</i></u>	<u><i>Planning and design stages</i></u>
<u><i>Contractor</i></u>	<u><i>Construction stage</i></u>



## Appendix 2 – Employer’s Information Requirements<sup>3</sup>

- 2.1 Project Information (*e.g. the employer, project name, project location, procurement method, project phasing (if any), site area, approximate gross floor area, building uses, etc. if not stated in the Agreement*)
- 2.2 Roles and Responsibilities in Information Management
- Employer
  - Project Participant
  - Design Consultant
  - Contractor
  - BIM Manager
  - BIM team leader
  - BIM team members
- 2.3 Technology Platform and Software Requirements
- Centralised electronic document management system (where applicable) including its functional requirements (*e.g. information delivery, information assurance, cyber/data security, information download and user functionalities such as data/model/file management, collaborative workflow, navigation and search, model viewers, dashboard and tender and contract management, etc.*)
  - Hardware
  - Software and its version numbers at the project commencement and completion stages
- 2.4 Training Requirements
- Training of the Employer and Project Participant for the access and operation of the centralised electronic document management system (where applicable)
  - Training for the specified Employer’s application(s) to be used on the Project
- 2.5 Model Structure and Management
- Planning of work and data segregation
  - File formats
  - File naming convention
  - Model structure/hierarchy
  - Origin point and coordinate system
  - General model and file management
    - Keeping a log of models and files uploaded and downloaded

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<sup>3</sup> This is only a generic framework for guiding the Employer to specify his project-specific requirements.

- Review of models for consistency
  - Backup of model files
  - Access rights
  - Security requirements
  - Archives at the end of each project stage
- 2.6 Model Coordination and Clash Detection
- Clash detection process including software utilisation, process overview, responsibility assignment and output report
  - Technical query workflow
  - Tolerance permitted
  - Clash resolution process
- 2.7 Model Collaboration Process
- Methodology, format and extent of model sharing and exchange at each project stage
  - Frequency of collaboration workshops for design coordination and clash detection purposes
  - Aggregated models for the Employer and Project Participant's reviews
- 2.8 Applicable Standards
- List of standards and guidance documents (*e.g. Building Information Modelling Standards published by the Hong Kong Construction Industry Council, Level of Development Specification published by the US BIMForum, Building Information Modelling for Asset Management – Standards and Guidelines published by the Electrical & Mechanical Services Department of the HKSAR Government, etc.*)
- 2.9 Modelling Requirements at each Project Stage
- Deliverables at each project stage stipulated in the Model Delivery Table (*e.g. conceptual design, schematic design, design development, contract documentation, construction and close-out and record deliverables*)
- 2.10 Requirements for Additional Modelling Activities or Uses
- Deliverables for each required modelling activity or use stipulated in the Appendix 1 (*e.g. design authoring, design reviews, modelling existing conditions, site analysis, 3D design coordination and clash detection, 3D construction coordination, construction scheduling and sequencing, as-built models for facilities management, etc.*)
- 2.11 Quality Assurance and Control
- Model suitability check (*e.g. model integrity, model validation and level of development definition according to the applicable BIM standards*)
  - Technical content check (*e.g. visual and clash detection*)

- Data completeness checks for asset or facility management (*e.g. completeness and suitability of data according to the applicable BIM standards*)
- Drawings extract check

*Note: All examples given in the Appendices 1 and 2 are for illustrative purposes only and must be replaced with the appropriate details.*



## Guidance Notes

*(These Guidance Notes do not form part of, and shall not affect the interpretation of, these BIM Contract Conditions.)*

### 1. Purposes of the BIM Contract Conditions

The main purposes of these BIM Contract Conditions are to set out obligations, responsibilities and liabilities of the employer and project participant related to:

- the production of BIM models at defined project stages and its subsequent uses, and
- the transmission, exchange, storage and archiving of digital data, including BIM models.

All project participants utilising BIM on the project are required to incorporate these BIM Contract Conditions into their contracts. This ensures that all project participants will adopt the same standards and ways of collaborative working specified in the BIM Contract Conditions.

### 2. Natures of the BIM Contract Conditions

These BIM Contract Conditions are not a stand-alone contract document and must be incorporated into existing professional services appointments and construction contracts in the form of either special conditions of contract or supplemental agreement.

Where these BIM Contract Conditions are incorporated as the special conditions of contract, all BIM related works and services are deemed to have allowed in the original agreement. Where the BIM Contract Conditions are executed as a supplemental agreement, the contracting parties may need to agree an adjustment to the original consultancy fee or contract sum and/or the contract period.

### 3. Incorporation into Agreements

The employer or his professional consultants must ensure that these BIM Contract Conditions are properly incorporated into, or attached to, the original agreement by making the appropriate amendments. Since there are different forms of professional services contracts and construction contracts, such amendments must be considered on a contract-by-contract basis. Professional advice must be sought in this regard.

### 4. Same Contract Conditions for all Project Participants

Since all project participants may utilise other's BIM models and digital data under a collaborative working environment, they must comply with the same standards and ways of working. For the purpose of maintaining consistency, only one standard set of BIM Contract Conditions is designed for all project participants on a project. Having said that, some provisions in the standard BIM Contract Conditions may be deleted if they are not applicable. For instance, a quantity surveyor is required to access to BIM models and other digital data but he is not required to carry out modelling tasks. Under such circumstances, those contract conditions that are not applicable can be deleted.

These BIM Contract Conditions are designed to be used in conjunction with different standard professional services contracts and construction contracts. As such, a common term “Project Participant” is used to unify the party’s names under different agreements. As defined under Clause 1.1.21, it refers to the signing party in the respective agreements, excluding the employer. Therefore, the project participant may include the architect, engineer, quantity surveyor, contractor and other persons directly engaged by the employer. It may further include the sub-consultant, sub-contractor and supplier when these BIM Contract Conditions are also incorporated into their respective sub-contracts. Therefore, for ease of interpretation, the project participant is the relevant contracting parties.

## **5. Linking with Sub-Contracts**

The BIM Contract Conditions cannot impose any obligations and responsibilities on other parties other than the two contracting parties. Other project participants (like sub-consultants, sub-contractors and suppliers) must also comply with the same standards and ways of working if they also access to and utilise other project participants’ BIM models and other digital data. Thus, whenever the employer enters into any other agreements utilising BIM, he must arrange to incorporate substantially the same terms into such agreements to enable other project participants to comply with these BIM Contract Conditions. There is a similar provision for the project participant for his sub-consultants, sub-contractors and suppliers. Through this flow-down process, the BIM Contract Conditions can permeate the entire project.

## **6. Priority of Contract Documents**

These BIM Contract Conditions shall form part of the contract between the contracting parties. If there is any conflict between these BIM Contract Conditions and the original agreement or contract, these BIM Contract Conditions will prevail unless otherwise stated in Appendix 1. This follows the traditional arrangement that “special conditions of contract” will prevail over “general conditions of contract”. Thus, care must be taken to ensure that there is no conflict between these BIM Contract Conditions and the original contract provisions.

While adopting BIM, the construction industry may still rely on different types of contract documents in the execution of projects. These may include specifications, bills of quantities/schedules of rates, drawings, schedules and other information extracted from BIM models and, sometimes, drawings prepared separately from BIM models. The general statement that the BIM Contract Conditions take precedence may not be enough to resolve conflicts, for instance, between different types of BIM model and between information extracted from a BIM model and specification. Thus, these BIM Contract Conditions prioritise the order of precedence of all contract documents. As stated in its footnote, this order of precedence may be amended as appropriate to suit the specific requirement of the project.

## 7. Main Obligations of the Project Participant

The BIM Contract Conditions set out three main BIM-related obligations of the project participant as follows.

- Producing the Model Elements to the Level of Development and at the project stage identified in the Model Delivery Table at Appendix 1;
- Performing the additional modelling activities or uses identified in Appendix 1; and
- Complying with all specified standards, processes and procedures in respect of the development, use, transmission, exchange, storage and archiving of the Digital Data.

The “model delivery table” defines the model element, the responsible model element author and the corresponding level of development at each project stage. Besides, it also defines the appropriate project stage, classification system for model elements and level of development.

There are different procurement strategies such as the design-tender-build, design-and-build, integrated project delivery, etc. Each procurement method will have its own division of responsibilities for the design consultant and contractor and thus, the required level of development (LOD). For instance, for the traditional design-tender-build procurement method, the BIM model must generally be built up to LOD 350 so that it contains sufficient details and data for proper tendering and subsequent construction purposes. However, even for the traditional contract, some building elements may be better designed by the contractor based on the design consultant’s design intent and/or performance specification. Under such circumstances, the BIM model built up to LOD 200 may be generally sufficient for tendering purposes.

The BIM models produced can be utilised to perform other modelling activities or uses such as existing condition modelling, site analysis, design visualisation, design coordination and clash detection, sustainability evaluation, structural analysis, energy analysis, lighting analysis, quantity take-off, 3D construction coordination, site utilisation planning, digital fabrication, construction scheduling and sequencing and as-built modelling for facility management. Appendix 1 allows the employer to identify the required BIM modelling activities or uses and the responsible project participant. For any required BIM uses, the responsible project participant is obliged to produce the specified deliverable at the specified project stage.

In producing basic BIM models and performing additional BIM modelling activities or uses, all responsible project participants are obliged to comply with specified standards, methods and procedures in respect of the development, use, transmission, exchange, storage and archiving of the digital data and BIM models. Appendix 2 sets out not only the specific standards, methods and procedures for all BIM related deliverables, but also the methods and procedures for exchange and collaboration of digital data and models.

## 8. Digital Data Exchange

One of the main purposes of these BIM Contract Conditions are to set out the relevant provisions in respect of the digital data exchange. Nowadays, the use of an internet-based centralised electronic document management system has become popular for providing a collaborative working environment so that various project participants can produce BIM models and other digital data using standard processes, standards and methods. Since this

system involves substantial resources in terms of hardware, software and human expert, Clause 5.1 allows an option for the employer to decide whether to use such system for the project.

There are many document (or information) management systems available on the market. Some are primarily file management systems, while others provide sophisticated functionalities to support the management, creation, coordination, sharing, dissemination and quality assurance of BIM models and digital data generated during the whole project lifecycle. Unless there is a strong support from the IT department, it is recommended to use commercial off-the-shelf products to reduce the need for computer programming. In this case, the platform and software to be utilised are stated in Appendix 1. Alternatively, the required functional requirements (such as file publication, document management, data security, search capability, dashboarding, viewing capabilities and mobile support) must be specified in Appendix 2.

Digital data exchange may create certain cyber risks such as electronic security breaches, unauthorised acts, virus attacks, hacking and information loss and/or damage. In order to mitigate these risks, the project participant is required to use his best endeavours to protect his digital data from cyber risks. In addition, the project participant is also required to regularly back up and store all digital data of the project in a secure and stable system.

Project participants may use different types of software tool to perform various BIM tasks. While the common data file format is developed to support an openBIM workflow across different software applications, interoperability may still be a challenge to any BIM projects. Adopting a fair allocation of responsibility, the project participant does not warrant that the software used is compatible with any software used by the employer or other project participants.

The BIM Manager is assigned for managing the centralised electronic document management system. As such, Clause 5.4 excludes the project participant's liability any data loss or corruption once he has properly transmitted his digital data to such system.

## **9. BIM Manager**

Different employers may have different management styles or requirements. For instance, some employers would prefer appointing a BIM manager directly so that they have an overall control of all digital data and BIM models. In government projects, either the lead design consultant or contractor should undertake the BIM manager's role.

In addition, the procurement strategies also affect the appointment of the BIM manager. Where the design-and-build or integrated project delivery method is used, there will likely be one BIM manager throughout the project. Where the traditional design-tender-build method is used, there may be two BIM managers in a project: (1) design team BIM manager and (2) construction team BIM manager. At the early construction stage, the design team BIM manager needs to transfer all BIM models and digital data to the construction team BIM manager.

Clause 7.1 provides flexibility for the appointment of a BIM manager. The employer can directly appoint an independent BIM manager throughout the project. Where the employer does not want to appoint a BIM manager directly, he can assign a key project participant(s),



usually the lead design consultant and/or contractor, to appoint a BIM manager for the specified project stages or the whole project. While appointed by the project participant, it is preferable to appoint an independent BIM manager. However, in small or simple projects, the responsible project participant may, if allowed by the employer, assign his BIM team leader to act as the BIM manager.

Even if the BIM manager is appointed by the design consultant or contractor, his duties must not be blurred with the design consultant or contractor's duties stipulated under the respective agreements. In particular, the BIM manager has no design related duties. While the BIM manager may assist in providing a combined BIM model and clash detection report, the responsibility for resolving clash and model coordination issues during the design and construction stages respectively remains with the relevant design consultants or contractor/sub-contractors (or their BIM team leaders).

The BIM manager's duties may vary from project to project, depending on the complexity of individual projects. Clauses 7.3 (a) to 7.3 (f) list out some essential duties of the BIM manager. These lists may be amended or deleted as appropriate. Clause 7.2 (g) allows the employer to specify other project information management duties of the BIM manager in detail in Appendix 2.

## **10. BIM Execution Plan**

The BIM execution plan must align with the procurement strategy of the project. Where the design-and-build procurement method is used, the BIM execution plan should cover both the design and construction stages of the project. Where the traditional procurement method is used, there may be two BIM execution plans such as the design stage BIM execution plan and the construction stage BIM execution plan which are prepared and submitted during the design and construction stages.

## **11. Insurances**

Generally speaking, the adoption of BIM does not give rise significant liability issues. It is however observed that there are myriad of professional liability and contractor's all risk insurance policies available in the market. Each may have different insurance coverages and liability exclusions. Therefore, it is advisable that the project participant should always consult with his insurer to ensure that the insurance policy would cover all liabilities arising out of these BIM Contract Conditions.

The BIM manager's role and the hosting and management of the centralised electronic document management system are generally considered as additional services. Therefore, if the project participant is required to undertake these duties, he should consult with his insurer on the insurance implications.

## **12. Appendix 1 – Contract Particulars**

It is important that the employer or his professional consultant should duly complete the required contract particulars at Appendix 1.

### **13. Appendix 2 – Employer’s Information Requirements**

The Employer’s Information Requirements define how the BIM models and digital data must be produced, delivered and used by the project participant, including its standards, procedures and processes. The exact nature of the employer’s information requirements will depend on the experience and requirements of the employer and the complexity of the project. Therefore, Appendix 2 is only a generic framework for guiding an individual employer to specify his project-specific requirements. It must be developed in detail before its execution so that the relevant time, cost and other implications can be properly assessed and taken into account by the employer and project participant.



