

Construction Industry Council BIM Certification and Accreditation Schemes

Application Guide for Certification of Building Information Modelling (BIM) Managers

1. Background

- 1.1** This Application Guide sets out the approach and procedures to be adopted in the processing and assessment of applications for certification of BIM Managers.
- 1.2** A “Roadmap for BIM Strategic Implementation in Hong Kong’s Construction Industry” was prepared by the Working Group on Roadmap for BIM Implementation under the then Committee on Environment and Technology of the Construction Industry Council (CIC) in 2014. One of the key initiatives in the Roadmap was to expedite the building up of BIM capacity and capability.
- 1.3** In 2017, the HKSAR Government decreed that BIM technology must be used in the design and construction of all major government capital works projects with a project cost estimate of more than HK\$30 million that were scheduled to start during or after 2018, and that the use of this technology in private construction projects should also be promoted. This has generated a surge in demand for BIM personnel and training needs.
- 1.4** To ensure that construction professionals have appropriate skill levels and competency in using BIM technology, and that the scope and quality of BIM courses provided in the market meet the needs of the industry, it was important to establish a certification body for BIM personnel and an accreditation body for BIM courses in Hong Kong.
- 1.5** To facilitate the healthy development of BIM in Hong Kong, CIC has introduced the BIM Certification and Accreditation Schemes to ascertain the competency of BIM personnel and the quality of local BIM training courses.

2. Eligibility Criteria for Certification of BIM Managers

2.1 Relevant Practitioner / BIM Practitioner

The Certification of BIM Manager is targeted at BIM practitioners who already have relevant practical experience in BIM projects, such as in development of BIM standards; planning, design, contract administration and execution of BIM projects in the areas of quantity surveying, construction management, project management, cost and programme management, design management and specification, and property management; BIM education; quality assurance, etc., meet the relevant academic and / or professional qualification requirements, and have completed a CIC-accredited BIM Manager Course.

2.2 Core Competencies of a BIM Manager

The Core Competencies of a BIM Manager are:

- (a) BIM Initiation (Ability to describe BIM concept definitions and scope, BIM standards and guidelines in the Hong Kong and global contexts).
- (b) BIM Software and Technologies (Ability to explain BIM software and the modelling process, and current and upcoming technologies).
- (c) BIM Uses and Processes (Ability to understand BIM uses and BIM software applications, and to design and manage the overall process of a BIM project).
- (d) Digital Information Management, Collaboration and Integration (Ability to plan and execute the setting-up of a common data environment and data quality control system for effective use and sharing of digital information in a BIM project).
- (e) Commercial and Contractual Aspects (Ability to describe commercial and financial issues of BIM as well as BIM-related contractual issues).
- (f) Communication Skills (Ability to apply effective interpersonal and communication skills in a variety of public and interpersonal settings, such as presentations, meetings, report / training material writing, etc.).

Core subjects of a BIM Manager Course under the BIM Certification and Accreditation Schemes are listed in Annex A of this Application Guide.

3. Assessment Criteria

3.1 The following assessment criteria will be adopted for Certification of BIM Managers:

- (a) the applicant has obtained:
 - a CIC-recognised professional qualification, e.g. corporate membership of The Hong Kong Institute of Architects (HKIA)¹, The Hong Kong Institution of Engineers (HKIE)² or The Hong Kong Institute of Surveyors (HKIS)³, OR
 - a degree accredited or recognised by a CIC-recognised professional body⁴ in architecture, engineering, surveying, building or construction, or equivalent, as recognised by CIC, plus 5 years of relevant post-degree experience (stationed in Hong Kong for at least 6 months); and
- (b) the applicant has in the past 5 years gained at least 2 years of practical experience in BIM (stationed in Hong Kong for at least 6 months), such as in development of BIM standards; planning, design, contract administration and execution of BIM projects in the areas of quantity surveying, construction

1 The Hong Kong Institute of Architects (<http://www.hkia.net>).

2 The Hong Kong Institution of Engineers (<https://www.hkie.org.hk>).

3 The Hong Kong Institute of Surveyors (<https://www.hkis.org.hk>).

4 List of CIC-recognised professional body is available on website of BIM Department of CIC (<http://www.bim.cic.hk>).

management, project management, cost and programme management, design management and specification, and property management; BIM education; quality assurance, etc.;

- (c) Submit a competency statement (incorporated in Form PN01-F-01), of between 1,500 and 2,500 words, to demonstrate the applicant's practical experience in BIM and English writing skills.
- (d) Successful completion of BIM Manager Course(s) accredited by CIC. A grace period of one year is allowed before new applicants are required to submit a completion certificate of a CIC-accredited BIM Manager Course in support of their applications. This grace period will end on 31 December 2019.

A 'grandfathering' consideration is offered to applicants who have at least 3 years of experience in BIM (stationed in Hong Kong for at least 2 years) on or before 31 December 2018. Application for this special consideration will lapse on 31 December 2019, after which it will not be applicable in the assessment of applications.

4. Processing and Assessment of Applications for Certification of BIM Managers

4.1 An applicant for certification as a BIM Manager must submit the following to the BIM Department of CIC for assessment:

- (a) completed application form for Certification of BIM Managers (Form PN01-F-01);
- (b) application fee (HK\$500);
- (c) certified true copies of membership certificates—related to a CIC-recognised professional qualification, e.g. corporate membership of HKIA, HKIE or HKIS, **OR** certified true copies of academic qualification certificates related to a degree accredited or recognised by a CIC-recognised professional body in architecture, engineering, surveying, building or construction, or equivalent, as recognised by CIC, plus proof of 5 years of relevant post-degree experience (stationed in Hong Kong for at least 6 months);
- (d) (i) A portfolio of work examples that proves the applicant has in the past 5 years gained at least 2 years of practical experience in BIM (stationed in Hong Kong for at least 6 months), such as in development of BIM standards; planning, design, contract administration and execution of BIM projects in the areas of quantity surveying, construction management, project management, cost and programme management, design management and specification, and property management; BIM education; quality assurance, etc.; **AND** (ii) a completed and signed Certification of Practical Experience in BIM (Annex of Form PN01-F-01);
- (e) a competency statement (incorporated in Form PN01-F-01), of between 1,500 and 2,500 words, to demonstrate the applicant's practical experience in BIM (see (d) above) and English writing skills (the 6 core competencies required for a BIM Manager are given in Section 2.2);

- (f) evidence of completing a CIC-accredited BIM Manager Course (e.g. completion certificate) (see Section 5.2 on the alternative arrangement during the grace period of 1 January to 31 December 2019); and
- (g) a curriculum vitae.

Upon receipt of an application, the BIM Department of CIC will assess the completeness of the documents submitted and will request the applicant to provide further details to substantiate the application, if needed.

4.2 The CIC BIM Assessment Panel (BIMAP) will review the content of the submitted documents, and if considered to be satisfactory, will invite the applicant to attend an interview. The purpose of the interview is to assess whether the applicant possesses the core competencies and practical experiences required for a BIM Manager.

Upon completion of the assessment, BIMAP will make a recommendation to the CIC BIM Certification and Accreditation Board (BIMCAB) for approval or disapproval.

The certification status of a BIM Manager shall be valid from the date of granting the certification status up to the end of that calendar year, and the names of the CIC-certified BIM Managers will be placed on the CIC-certified BIM Managers Register.

4.3 It is expected that the application process will take around 4 to 6 months in normal circumstances. The application process consists of 3 stages:

- (a) documents verified by BIM Department of CIC.
- (b) assessment interview performed by BIMAP after reviewing the submitted documents.
- (c) approval/disapproval by BIMCAB.

5. 'Grandfathering' Policy and Grace Period

5.1 A 'grandfathering' consideration is offered to applicants who have at least 3 years of practical experience in BIM (stationed in Hong Kong for at least 2 years) on or before 31 December 2018. CIC will only accept applications under this special consideration up to 31 December 2019, after which it will not be applicable in the assessment of applications. For this category, an applicant must submit the documents as those listed under Section 4.1(a) to (d) and (g), except that under Section 4.1(d), the applicant shall have at least 3 years of practical experience in BIM (stationed in Hong Kong for at least 2 years). An applicant may be invited to attend an interview by the BIMAP.

5.2 To implement the requirement under Section 4.1(f) and to cater for new/updated BIM standards in future, a grace period of one year is allowed before new applicants are

required to submit a completion certificate for a CIC-accredited BIM Manager Course in support of their applications. This grace period will end on 31 December 2019.

6. Notification of Assessment Result

6.1 Applicants will be recommended for the CIC-certified BIM Manager qualification if the assessment is favourable. Applicants will be informed of the result by mail.

7. Payment

7.1 Fee payable

A non-refundable application fee of HK\$500 is required for the application.

7.2 Payment Method

Applicants should pay the required application fee by cheque, which should be made payable to “Construction Industry Council”. All payments received are non-refundable, non-endorsable and non-transferable.

8. Certification Validity

8.1 The certification status of a BIM Manager shall be valid from the date of granting the certification status up to the end of that calendar year, and the names of the CIC-certified BIM Managers will be placed on the CIC-certified BIM Manager Register.

9. Renewal of Registration

9.1 The BIM Department of CIC will send a renewal application form to the CIC-certified BIM Managers on a yearly basis at least 3 months prior to the date of expiry of their existing certification.

9.2 Upon receipt of the renewal application form, the CIC-certified BIM Managers should submit the following to the BIM Department of CIC for renewal at least 1 month prior to the date of expiry of the existing certification:

- (a) signed renewal application form (Form PN01-F-02), confirming that they have undertaken at least 12 hours of BIM-related Continuing Professional Development (CPD) in the past year, and associated documents if applicable; and
- (b) renewal fee (HK\$300).

The CIC-certified BIM Managers should keep records of the BIM-related CPD undertaken during the year (including attendance at any CIC-recognised courses, conferences or seminars, documented self-study, etc.). They may be requested to provide evidence of the BIM-related CPD completed in the past 3 years, without which the renewal application may not be considered.

Once a renewal application is found to be in order, the BIM Department of CIC will pass it to BIMAP for assessment. On completion of the assessment, BIMAP will make a recommendation to BIMCAB.

9.3 The name of the CIC-certified BIM Managers will be removed from the CIC-certified BIM Managers Register after expiry of their existing certification if they fail to return the signed renewal application form and associated documents, together with the renewal fee, by that time.

10. Application for reinstatement

10.1 A person whose name has been removed from the CIC-certified BIM Managers Register may, within 2 years of the date of expiry of the last certification, apply for reinstatement of the certification. Applications for reinstatement should be made using Form PN01-F-02, following the procedure described in Section 9.2. The applicant is required to pay any other outstanding subscription since the date of expiry of the certification and /or registration, and submit associated documents, if requested.

10.2 A person whose name has been removed from the CIC-certified BIM Managers Register for more than 2 years from the date of expiry of the last certification/registration, will need to submit a fresh application for certification as a BIM Manager and the procedure given in Section 4 applies.

11. Appeal/Disciplinary Cases

11.1 An applicant for certification as a BIM Manager, including renewal/ reinstatement of registration, who is dissatisfied with a decision of BIMCAB may appeal to the CIC BIM Appeal and Disciplinary Board (BIMADB). An applicant exercising the right of appeal should submit the following to the BIM Department of CIC, no later than 21 days after receiving notification of the decision of BIMCAB:

- (a) a completed application form for appeal (Form PN01-F-03); and
- (b) an application fee (HK\$1,500).

11.2 Upon receipt of an appeal case, BIMADB will review the case upon receipt of all necessary documentation about the case. BIMADB's decision is final. BIMADB will inform BIMCAB of its decision. The application fee will be refunded to the applicant if the appeal is found to be valid.

11.3 Applicants will be informed of the result by mail.

11.4 BIMADB also deals with disciplinary cases. Upon receipt of a disciplinary case, BIMADB will review the case, as appropriate, following the same procedures given in Sections 11.2 to 11.3.

12. Application

12.1 Email is the primary communication channel between CIC and the applicants. Applicants are recommended to regularly check the mailbox of their email address(es) provided to CIC in their application forms.

12.2 The completed Application Form with all necessary supporting documents should be submitted by email to bimcas@cic.hk or by post to the BIM Department of CIC at the following address:

Private and Confidential - Application for Certification of BIM Manager

BIM Department - Construction Industry Council
38/F, COS Centre
56 Tsun Yip Street
Kwun Tong, Kowloon

13. Enquiry

BIM Department - Construction Industry Council
38/F, COS Centre
56 Tsun Yip Street
Kwun Tong, Kowloon

Tel : 2100 9000

Fax : 2100 9090

Email : bimcas@cic.hk

-End-

List of Core Subjects of a BIM Manager Course under the Building Information Modelling (BIM) Certification and Accreditation Schemes (the "Schemes")

Minimum Level of Competency:

Level 1(L1) : General appreciation of the subject and an understanding of how the subject may affect, or integrate with other subjects.

Level 2 (L2): Knowledge and understanding of the subject and its application.

Level 3 (L3): Ability to perform the subject independently or under supervision.

Level 4 (L4): Ability to perform the subject without supervision and advise others.

	Core Subject	L1	L2	L3	L4
1. BIM Initiation	<i>1.1. BIM Concept</i>				
	1.1.1 BIM definitions and terminology	✓			
	1.1.2 The difference between 2D CAD, 3D CAD and BIM	✓			
	1.1.3 Concept of BIM as whole project & whole estate perspective	✓			
	1.1.4 Value and benefits of adopting BIM	✓			
	1.1.5 Value of BIM for AM & FM	✓			
	1.1.6 Collaborative working in BIM	✓			
	1.1.7 Limitation of BIM	✓			
	1.1.8 Challenges within existing working practices & how BIM addresses these		✓		
	1.1.9 How BIM affect the current practice in AECO industry		✓		
	<i>1.2. Local & Global Contexts, BIM standards and guidelines</i>				
	1.2.1 Local BIM standards & resources		✓		
	1.2.1.1 CIC BIM Standards		✓		
	1.2.1.2 Government BIM standards & resources		✓		
	1.2.2 Global context in BIM development	✓			
	1.2.3 Global BIM standards & resources		✓		
	1.2.3.1 ISO 19650		✓		
	1.2.3.2 BIM FORUM LOD Specification		✓		
	1.2.3.3 OpenBIM		✓		

-	Core Subject	L1	L2	L3	L4
2. BIM Software and Technologies	2.1. BIM Software				
	2.1.1	Overview of industry leading BIM software/applications		✓	
	2.1.2	Characteristic, strength and limitation of industry leading BIM software	✓		
	2.1.3	Versions and file formats	✓		
	2.1.4	Interoperability across industry leading BIM software	✓		
	2.2. Technologies				
	2.2.1	Cloud platform	✓		
	2.2.2	Laser scanning		✓	
	2.2.3	Photogrammetry		✓	
	2.2.4	GIS		✓	
	2.2.5	Application of smart devices		✓	
	2.2.6	VR/AR/MR		✓	
	2.2.7	VDC	✓		
	2.2.8	RFID		✓	
	2.2.9	Gaming technology in BIM	✓		
	2.2.10	Robotics	✓		
	2.2.11	Automation	✓		
	2.2.12	API	✓		
	2.2.13	MiC	✓		
	2.2.14	Indoor positioning	✓		
2.2.15	Upcoming Trend	✓			

	Core Subject	L1	L2	L3	L4
3. BIM Uses and Processes	<i>3.1. – Client BIM Strategic Stage</i>				
	3.1.1 BIM strategy, BIM uses, BIM processes	✓			
	3.1.2 Key personnel in relation to BIM	✓			
	3.1.3 Determine the info management & CDE strategy				✓
	3.1.4 Determine the BIM/AIM/GIS strategy				✓
	3.1.5 Determine level of development in the context of graphics and information				✓
	3.1.6 Determine level of integration of digital information into asset & facility management				✓
	3.1.7 Case study		✓		
	<i>3.2. – Client Pre-tender Project Stage</i>				
	3.2.1 Determine & oversee the development of Client Information Model (CIM)				✓
	3.2.1.1 Organisational Information Requirements (OIRs)				✓
	3.2.1.2 Asset Information Requirements (AIRs)				✓
	3.2.2 Employers Information Requirements (EIR)				✓
	3.2.3 Determine project technology & systems requirement & integration				✓
	3.2.4 Determine project delivery requirements				✓
	3.2.5 Determine the soft landings approach				✓
	3.2.6 Contract & consultancy requirement		✓		
	3.2.7 Assessment on supply chain capability & capacity (Tender Assessment)				✓
	3.2.8 Case study		✓		
	<i>3.3. – Definition & Design Stage</i>				
	3.3.1 BIM Execution Plan developed by supply chain				✓
	3.3.1.1 Pre-contract BIM Project Execution Plan				✓
	3.3.1.2 Post-contract BIM Project Execution Plan				✓
	3.3.2 Supervision in fulfilling BIM uses in planning & design stages listed in CIC BIM Standards				✓
	3.3.3 Project Information Model (PIM) data exchanges and validation				✓
	3.3.4 BIM PIM file setup				✓
	3.3.4.1 BIM origin point & orientation setup				✓
	3.3.4.2 Model division				✓
	3.3.4.3 Modelling methodology				✓
	3.3.4.4 Project-based industry and BIM standards				✓
	3.3.5 Direct BIM related meetings				✓

Core Subject	L1	L2	L3	L4
3.3.5.1 Meeting with high level				✓
3.3.5.2 Meeting with supply chain level				✓
3.3.5.3 Internal meeting				✓
3.3.5.4 Multidiscipline collaboration meeting				✓
3.3.6 Case Study		✓		
<i>3.4. – Construction Stage</i>				
3.4.1 BIM Execution Plan developed by supply chain				✓
3.4.1.1 Pre-contract BIM Project Execution Plan				✓
3.4.1.2 Post-contract BIM Project Execution Plan				✓
3.4.2 Supervision in fulfilling BIM uses in construction & handover stage listed in CIC BIM Standards				✓
3.4.3 Project Information Model (PIM) data exchanges and validation				✓
3.4.4 Direct BIM related meetings				✓
3.4.5 Case study		✓		
<i>3.5. – Handover Stage</i>				
3.5.1 As-built information verification				✓
3.5.2 Oversee data transfer from PIM to Asset Information Model (AIM)				✓
3.5.3 Supervision in fulfilling BIM uses in handover stage listed in CIC BIM Standards				✓
3.5.4 Case study		✓		
<i>3.6. – Operation & Maintenance Stage</i>				
3.6.1 Update Assets Information Model (AIM)		✓		
3.6.2 Roles, responsibilities and authorities for maintaining the AIM		✓		
3.6.3 Post occupancy evaluation		✓		
3.6.4 Case Study		✓		

-	Core Subject	L1	L2	L3	L4
4. Digital Information Management, Collaboration and Integration	<i>4.1. Digital Information Management</i>				
	4.1.1 Value of data & how it should be managed		✓		
	4.1.2 Interoperate data/information to facilitate cross-disciplinary and cross-BIM platform collaboration		✓		
	4.1.3 Limitation of BIM software in relation to information management		✓		
	4.1.4 Determine level of development in the context of graphics and information in different stages				✓
	4.1.5 Determine level of integration of digital information into asset & facility management				✓
	4.1.6 Oversee the process and quality of information exchange				
	4.1.6.1 Understanding IFC / BCF / XML...etc.		✓		
	4.1.6.2 Understanding COBie		✓		
	<i>4.2. Common Data Environment (CDE)</i>				
	4.2.1 Overview of CDE		✓		
	4.2.2 Overview of various CDE platform		✓		
	4.2.3 Setup of CDE			✓	
	4.2.4 Assessment of CDE			✓	
	4.2.5 Management of CDE				✓
	4.2.6 Limitation of CDE		✓		
	<i>4.3 – Data Quality Control & Assurance across various stages</i>				
	4.3.1 System checking				✓
	4.3.2 Model audit				✓
	4.3.3 Model checking				✓
	4.3.4 Audit reporting				✓

-	Core Subject	L1	L2	L3	L4
5. Commercial and Contract	<i>5.1 Commercial Issue</i>				
	5.1.1 Establishing BIM ready Environment to support the corporate				
	5.1.1.1 BIM strategy in organisation level		✓		
	5.1.1.2 Challenges in BIM implementation		✓		
	5.1.1.3 Phases in BIM implementation				✓
	5.1.1.4 Hardware requirement for BIM		✓		
	5.1.1.5 Software requirement for BIM		✓		
	5.1.1.6 Manpower management for BIM				
	5.1.1.6.1 Staff plan				✓
	5.1.1.6.2 Staff recruitment				✓
	5.1.1.6.3 Staff training				✓
	5.1.2 Promotion of adopting BIM in office/to clients				
	5.1.2.1 Value and benefit of adopting BIM	✓			
	5.1.2.2 Value and benefit of data and information from BIM	✓			
	5.1.2.3 Evaluating Return on Investments (ROI) of adopting BIM		✓		
	<i>5.2. Contract Issue</i>				
	5.2.1 Ownership of data	✓			
	5.2.2 Intellectual property right	✓			
	5.2.3 Legal implication and potential liability	✓			
	5.2.4 Professional indemnity	✓			
	5.2.5 Introducing NEC	✓			
	5.2.6 Commercial implications for contracts & insurances in relation to BIM	✓			