CONSTRUCTION INDUSTRY COUNCIL
建造業議會

BIM

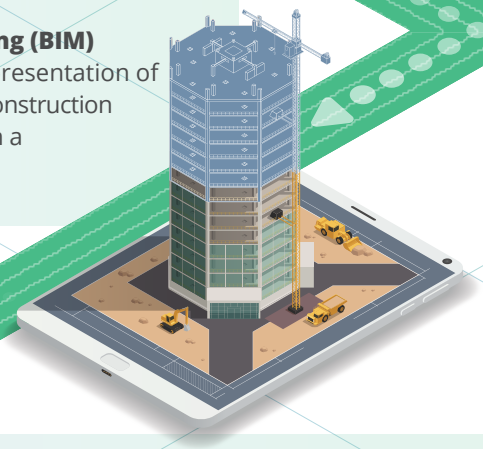
CIC Beginner's Guide on Construction Digitalisation – **Adoption of BIM in Small and Medium Enterprises**

2022

WHY BIM?

What is BIM?

Building Information Modelling (BIM) is the use of a shared digital representation of a built asset to facilitate design, construction and operation processes to form a reliable basis for decisions.



Benefits of BIM

FOR DESIGN PROFESSIONALS :

- Reduces the amount of time required for design, coordination, communication and documentation
- Increases versatility in terms of geometry and materials, and leads to a better rendering and visualisation of design

FOR CONTRACTORS AND BUILDERS :

- Allows a better production flow that leads directly to reduced material wastes, reduced waste of workers' time, fewer reworks and abortive works
- Facilitates project management and improves project delivery quality

FOR OWNERS AND OPERATORS :

- Guides the design and construction teams to better meet the owner's goals
- Provides a basis for designing any future renovations
- Increases sustainability through better energy performance

What can BIM do for your organisation?

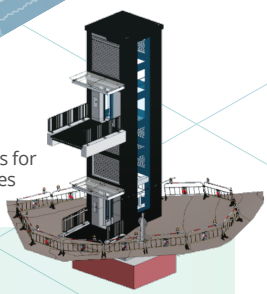
BIM is used for creating and managing data throughout the building asset lifecycle.

There are a variety of BIM uses during the design, construction and operation process, such as Design Review, Cost Estimation and 3D Construction Coordination.

Successful Examples

M+, Hong Kong
Photo taken by Joe Wong
Courtesy of M+, Hong Kong

CIC-ZCP emMiC Stormwater cooling system



Lift & BFA Facilities for Highway Structures

All public works projects and numerous large-scale private projects by large companies have already implemented BIM. There are many successful projects by smaller companies as well.

Examples of BIM-enabled successful construction projects include large-scale projects, such as M+ and Two Taikoo Place and smaller projects, such as CIC-ZCP emMiC Stormwater cooling system and Barrier-free Access Facilities (BFA) for Highway Structures Phase 3.

Steps to get started

STEP 1

Establish Your Vision, Mission and Values

Focus on the existing vision of your organisation. Review and assess your organisation existing BIM capability and infrastructure.

Also identify your clients' requirements on digitalisation including BIM and Common Data Environment (CDE), and prioritise your resources on satisfying them.

Digital transformation is a people-led process. To successfully adopt BIM at organisational level, upper management as well as operating levels' buy-in are keys to success.

STEP 2

Get People On-board – Roles of BIM Personnel

CIC CERTIFIED
BIM MANAGER
建造業議會認可建築信息模擬經理

BIM Manager

- Develop BIM policy, strategy, roadmap and implementation plan for the organisation and its projects.
- Assess the BIM resources requirements, organise and coordinate the resources of the BIM team for the projects.
- Lead the BIM implementation in the projects to meet the objectives of the projects.
- Lead the BIM training in corporate and project level.

CIC CERTIFIED
BIM COORDINATOR
建造業議會認可建築信息模擬協調員

BIM Coordinator

- Supervise the work of BIM modellers, and carry out their duties if necessary.
- Coordinate and assist in BIM implementation and ensure all project BIM deliverables comply with the relevant BIM standards and project specifications and requirements.
- Communicate and coordinate with internal and external project stakeholders, including clients, architects, engineers, surveyors, contractors and operation teams.

BIM Viewer

- View and understand BIM models, e.g. senior management, project managers, site supervisor, safety inspector, foreman and workers, etc.

BIM Modeller

- Build and maintain BIM models, objects and datasets, and generate drawings and schedules for coordination and submission.

Set Up a BIM Team and Let It Nurture

No one-size-fit-all solution: The size and composition of a BIM Team depends on the organisation requirements, size, project type and scale. A SME with 10-50 employees should have ideally at least one BIM Manager or Coordinator (preferably with CIC certification) to communicate and coordinate with external project stakeholders, execute BIM projects and lead organisational BIM training.

Coaching from the experienced: Project-based coaching or hiring of an external BIM consultant should be considered. The long-term goal should be to develop in-house BIM capability for maximal benefits of BIM workflow.

Encourage BIM champion: A BIM champion is tasked to promote BIM and demonstrate the benefits of BIM to the organisation. The BIM champion will need to be enthusiastic, self-driven and adaptable.

Identify potential candidates: Potential candidates should be encouraged to further enhance their knowledge in BIM, e.g. draftsman should be encouraged to attend BIM Modelling course to allow them to take up the role of BIM Modeller.

Everyone gets to know BIM: There are lots of free online resources to learn BIM, a good example of which is the CIC Teaching and Learning Kits for BIM Viewer Training. A CIC BIM Viewer Certificate will be awarded upon completion of the self-learning or instructor-led CIC Viewer Training and Quiz.

BIM Champions - Establish Accountability

After identifying potential applications of BIM in pilot projects, BIM Team Leaders should be assigned to the projects to give them ownership and accountability for their role in BIM and digital transformation.

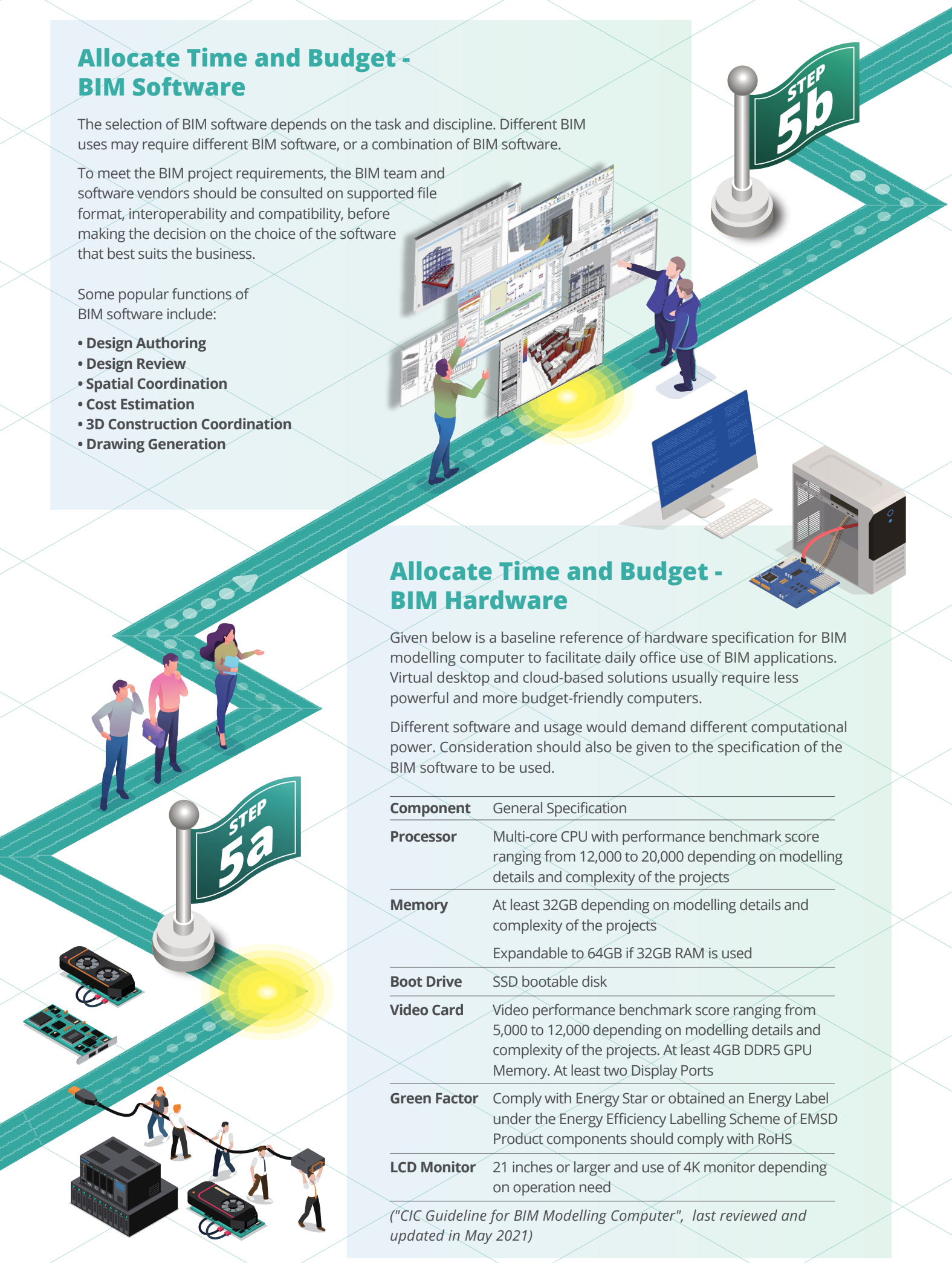
Allocate Time and Budget - BIM Software

The selection of BIM software depends on the task and discipline. Different BIM uses may require different BIM software, or a combination of BIM software.

To meet the BIM project requirements, the BIM team and software vendors should be consulted on supported file format, interoperability and compatibility, before making the decision on the choice of the software that best suits the business.

Some popular functions of BIM software include:

- **Design Authoring**
- **Design Review**
- **Spatial Coordination**
- **Cost Estimation**
- **3D Construction Coordination**
- **Drawing Generation**



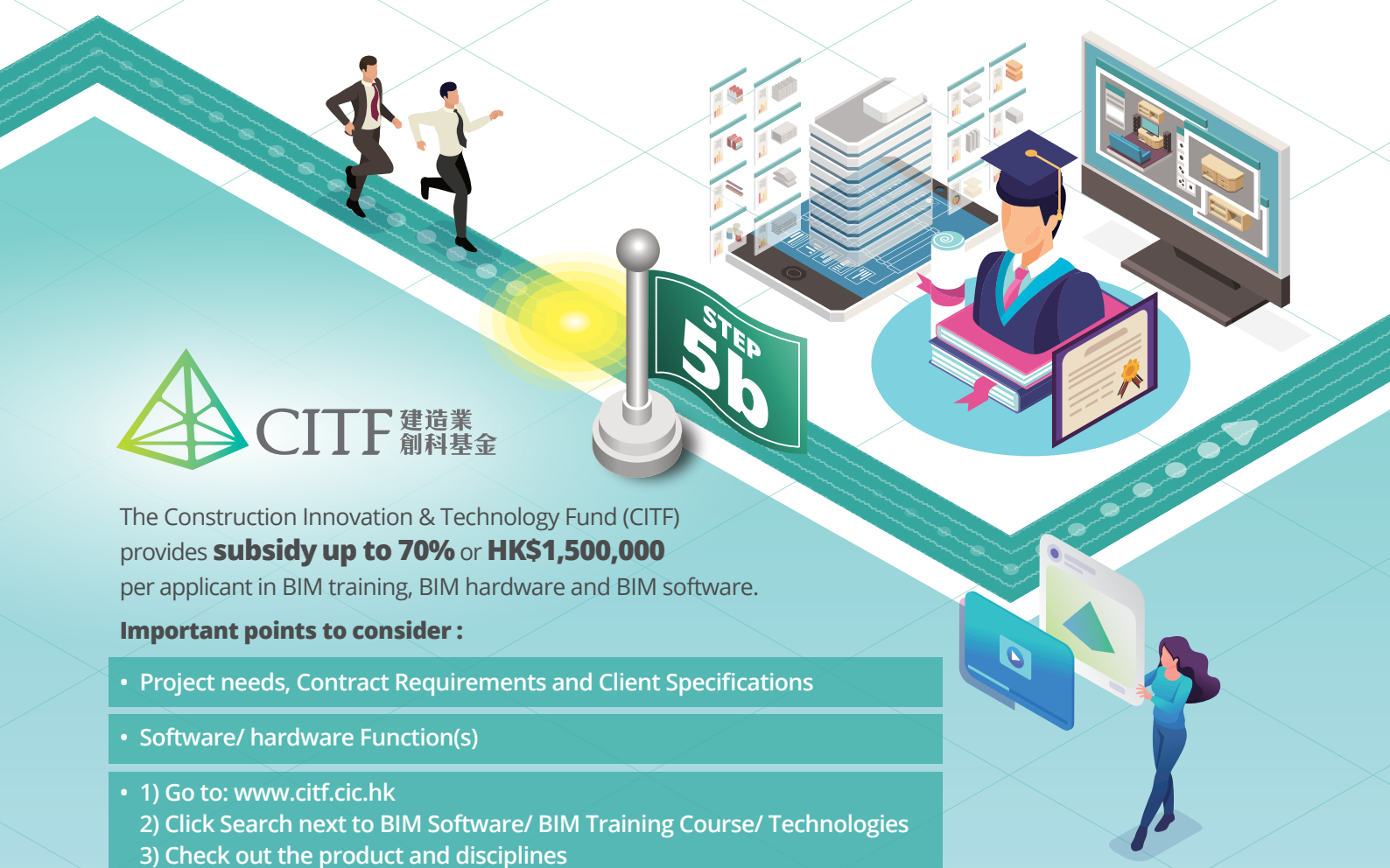
Allocate Time and Budget - BIM Hardware

Given below is a baseline reference of hardware specification for BIM modelling computer to facilitate daily office use of BIM applications. Virtual desktop and cloud-based solutions usually require less powerful and more budget-friendly computers.

Different software and usage would demand different computational power. Consideration should also be given to the specification of the BIM software to be used.

Component	General Specification
Processor	Multi-core CPU with performance benchmark score ranging from 12,000 to 20,000 depending on modelling details and complexity of the projects
Memory	At least 32GB depending on modelling details and complexity of the projects Expandable to 64GB if 32GB RAM is used
Boot Drive	SSD bootable disk
Video Card	Video performance benchmark score ranging from 5,000 to 12,000 depending on modelling details and complexity of the projects. At least 4GB DDR5 GPU Memory. At least two Display Ports
Green Factor	Comply with Energy Star or obtained an Energy Label under the Energy Efficiency Labelling Scheme of EMSD Product components should comply with RoHS
LCD Monitor	21 inches or larger and use of 4K monitor depending on operation need

("CIC Guideline for BIM Modelling Computer", last reviewed and updated in May 2021)

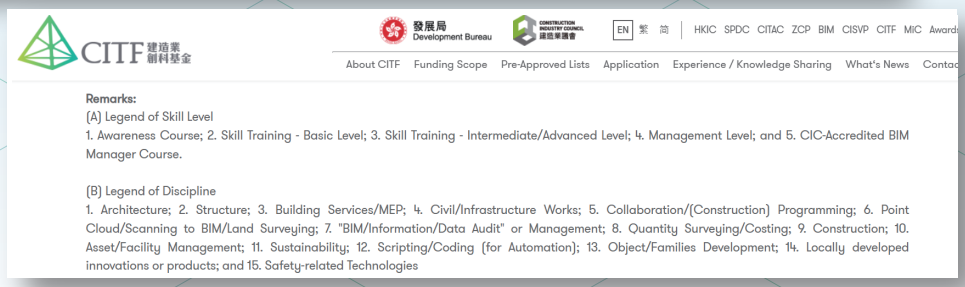


CITF 建造業創科基金

The Construction Innovation & Technology Fund (CITF) provides **subsidy up to 70%** or **HK$1,500,000** per applicant in BIM training, BIM hardware and BIM software.

Important points to consider :

- Project needs, Contract Requirements and Client Specifications
- Software/ hardware Function(s)
- 1) Go to: www.citf.cic.hk
  2) Click Search next to BIM Software/ BIM Training Course/ Technologies
  3) Check out the product and disciplines



STEP 5b

To arrive at a suitable BIM adoption plan for your company would require thorough evaluation of the need of the business and leadership vision.

Given below are practical scenarios of real companies on their selection of BIM Software, Hardware and Training. These examples aim to give you an idea of the budget, time and resources involved in the digitalisation process. The examples are not meant to be exhaustive and are for reference only.

For full CITF pre-approved list, please visit: www.citf.cic.hk

Scenario A (Architectural Related)

				CITF Subsidy		
Category	**Product Name / Details**	**Functions**	**Reference Price (HK$)**	**Co-fund %**	**Subsidy Amount (HK$)**	**User-borne Amount (HK$)**
BIM Software	AutoCAD Revit LT Suite Commercial New Single-user ELD Subscription (3 Years)	Architectural BIM model building	$ 18,153	70%	$ 12,707	$ 5,446
	ARCHICAD International Commercial Single / Net License with CodeMeter Keyplug for ARCHICAD (Purchased)		$ 34,670	70%	$ 24,269	$ 10,401
BIM Training	Revit Fundamental (Introduction and Architectural Modeling) 8 hours (Full-Time)	Enable user to build BIM model	$ 3,000	HK$3,000 or 70% of the course fee, whichever is higher	$ 3,000	Nil
	Building Information Modelling (BIM) Basic Modelling Course – ArchiCAD (BAEZ) 3 hours x 10 sessions	Enable user to view and understand the BIM model	$ 2,200	N/A	$ 2,200	Nil

Scenario B (MEP Related)

Category	**Product Name / Details**	**Functions**	**Reference Price (HK$)**	**Co-fund %**	**Subsidy Amount (HK$)**	**User-borne Amount (HK$)**
BIM Software	BricsCAD BIM	MEP BIM model building	$ 18,750	70%	$ 13,125	$ 5,625
	Cubicost TME	Quantity takeoff for MEP	$ 18,800	70%	$ 13,160	$ 5,640
BIM Training	Bricsys Learning (Online: lessons.bricsys.com)	Enable user to build BIM model	Nil	Nil	Nil	Nil
	Building Information Modelling (BIM) - Cubicost TRB (Basic) 1 Day	BIM-based quantity takeoff for MEP	$ 3,000	HK$3,000 or 70% of the course fee per course, whichever is higher	$ 3,000	Nil

Scenario C (Civil / Structural Related)

Category	**Product Name / Details**	**Functions**	**Reference Price (HK$)**	**Co-fund %**	**Subsidy Amount (HK$)**	**User-borne Amount (HK$)**
BIM Software	Tekla Structures Steel Detailing (STD-C) Commercial New Domestic License	Structural / Civil BIM model building	$ 91,710	70%	$ 64,197	$ 27,513
	Civil 3D Commercial New Single-user ELD subscription		$ 17,209	70%	$ 12,046	$ 5,163
BIM Training	Building Information Modelling (BIM) Advanced Modelling (Civil) – Civil 3D 7.5 hours x 4 sessions	Enable user to build BIM model	$ 2,500	N/A	$ 2,500	Nil

Scenario D (4D Animation Related)

Category	**Product Name / Details**	**Functions**	**Reference Price (HK$)**	**Co-fund %**	**Subsidy Amount (HK$)**	**User-borne Amount (HK$)**
BIM Software	Fuzor Virtual Design Construction	4D Simulation	$ 69,713	70%	$ 48,799	$ 20,914
	Navisworks Manage Commercial New Single - user ELD Subscription		$ 17,843	70%	$ 12,490	$ 5,353
BIM Training	Building Information Modelling (BIM) Course (Design, Analysis, Construction Management and Collaboration) - Fuzor	Enable user to create 4D Simulation	$ 2,200	N/A	$ 2,200	Nil

Take a Step-by-step Approach

Identify, execute and review a pilot project in testing BIM implementation. The pilot project can help you understand the BIM tools, BIM workflow, and gauge the effectiveness of BIM.

While working on the pilot project, it is essential to document the lessons learnt from the digital transformation. It is also important that your team members understand the challenges and the BIM vision.

6 Useful Resources

CIC BIM Portal (a centralised place of all CIC BIM resources, including the followings) : www.bim.cic.hk

BIM TOURS

- iHub
- CIC BIM event
- CIC BIM showcase
- CIC i-Club webinar

TRAININGS

- CIC BIM training e-resource
- Online training resources useful links
- BIM Viewer teaching and learning kits

LIBRARY

- BIM Standards-related publications
- BIM Objects Library (Free download)

COURSES

- CIC certification of BIM personnel and accreditation of BIM training course
- HKIC BIM Courses

CITF

- CITF homepage
- CITF Pre-Approved List

DIGITALISATION

- CIC Construction Digitalisation Roadmap for the industry

Celebrate Micro Goals and Achievements!

Evaluation and Improvement

Measure the effectiveness of the pilot BIM project based on the pre-established Key Performance Indicators (KPIs).

Continue to refine the BIM workflow and BIM execution plan for any future BIM implementation.

Frequently Asked Questions

Where can I find out more about BIM?

You may visit the CIC BIM Portal, a centralised place of all CIC BIM resources (www.bim.cic.hk)

What is the cap for CITF subsidy?

The Construction Innovation & Technology Fund (CITF) provides subsidy up to 70% or HK$1,500,000 per applicant in BIM training, BIM hardware and BIM software.

How should I introduce BIM to my employees?

The CIC Teaching and Learning Kit for BIM Viewer Training offers instructor-led teaching or self-learning. Students can gain basic knowledge to view and navigate a BIM model.

Does every company require a CCBM or CCBC?

No. The size and composition of a BIM Team depends on the contract or client requiement, project size and scale. An organisation which does not need to execute a BIM project may not require a CCBM.

Is BIM expensive?

Embracing BIM will cost the organisation some initial investment in hardware, software, and training. In the long term, the organisation can realise the benefits of BIM.

With CITF subsidy, the initial investment can be covered up to 70%.

Disclaimer

The information provided in this Beginner's Guide should be used by the industry as a reference to BIM adoption. Users are encouraged to seek appropriate independent advice from their professional advisers where possible. Readers should not treat or rely on this publication (Reference Material) as a substitute for such professional advice.

Enquiries

Enquiries on the Reference Material may be made to the CIC Secretariat:

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