



CIC
BIM
COMPETITION
2023

A competition to promote practical use of BIM through collaborative and competitive learning approach

CIC BIM Competition 2023

Competition Design Brief

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Version Control

Version	Description	Date
-	First release	1 December 2022

1. General Brief

1.1 Organiser

The CIC BIM Competition 2023, refer as the “Competition”, is organised by the Construction Industry Council (CIC), located at 38/F, COS Centre, 56 Tsun Yip Street, Kwun Tong, Kowloon, Hong Kong.

1.2 Competition Design Brief

This document contains the design brief, competition detailed requirements, submission deliverable requirements, guidance, assessment scoring criteria, awards and prizes, terms and conditions defined for this Competition.

1.3 Use of Information

All the information of this document is meant for the use of this sole Competition only and shall not be used for reference in actual design nor construction project in future, if any, for the particular site.

1.4 Liability of the CIC

The CIC shall not be held liable for any consequences, losses or damages which may arise or result from any misuse by any parties or reliance made on its information for any purposes in future.

2. Introduction

2.1 Background

The 2-stage ideas Competition aims at continuing to build momentum for Building Information Modelling (BIM) adoption and encourage collaboration. Participants will be given project design requirements to develop a **Construction Innovation Campus using BIM for a proposed site**.

2.2 Objective

The Competition’s objective is to **promote practical uses of BIM through collaborative and competitive learning approach** among higher education students in construction-related disciplines.

2.3 Eligibility

2.3.1 This Competition is only eligible to full-time higher education (post-secondary) students, and part-time students who are pursuing top up degrees. Students shall form a team of 3 to 6 members from a minimum of 2 construction-related disciplines. (Refer to Section 10.1).

2.3.2 There is no limit to the number of teams from each institution.

2.4 Competition Schedule

Date	Activities
1 Dec 2022	Open for Registration
21 Dec 2022	Competition Briefing Webinar
Dec 2022 - Apr 2023	Online Training Materials
3 Feb 2023	Deadline for Registration
Feb 2023 - Jun 2023	Free BIM Software Licenses
Feb 2023 - May 2023	Hands-on BIM Software Training Webinars
Mar 2023 - Jun 2023	BIM Mentoring Support
1 Jun 2023 (12:00nn)	Submission Deadline for 1 st Round Competition
8 Jun 2023	Judging Panel selects teams for 2 nd Round Competition
16 Jun 2023 (Fri)	2 nd round onsite competition (9:00am-9:00pm) (Finalists being selected to compete onsite within 12 hours)
17 Jun 2023 (Sat)	2nd Round Onsite Competition am: Team presentation to Judging Panel pm: Award Presentation Ceremony

3. Design Brief, Competition Details and Requirements

Design Competition on Construction Innovation Campus using BIM

(This Design Brief is intended for this Competition only, and shall not be allowed for releasing, publishing or use for other intentions.)

3.1 Theme and Objective

The theme of this competition is “**Sustainable Design of the Construction Innovation Campus**”.

This competition aims to challenge the participant’s creativity and innovation in the design of a **Construction Innovation Campus** using BIM.

The proposed development of the Construction Innovation Campus serves as a Construction Innovation & Technology Transfer Centre, an expansion of the Construction Industry Council’s Construction Innovation and Technology Application Centre (CITAC). Please refer to Section 4 for details of the existing CITAC.

In this competition, participants may assume that they are submitting a proposed design for the **client (CIC) to develop the Construction Innovation Campus for a proposed site using BIM.**

3.2 Background

In line with the Chief Executive's Policy Address 2022 on construction projects, large and smaller projects, to be completed on time with good quality, our architecture, engineering, construction and operations (AECO) industry is committed to achieve with various targets with full adoption of digitalisation.

The use of advanced technologies and construction methods, such as BIM, Design for Manufacture & Assembly (DfMA), Modular Integrated Construction (MiC), Multi-trade Integrated MEP (MiMEP), automation & robotics, Artificial Intelligence (AI) and related IT technologies are keys to uplift productivity. Safety and sustainability are the most concerns in developing our built environment while we strive for enhancing speed, quantity, efficiency and liveability.

Construction Digitalisation can be applied for all processes in the built asset lifecycle, from planning to design and from construction to operations upon completion of projects. Training sufficient practitioners with various levels of BIM knowledge and technical skills are essential for building up capability and capacity of our AECO industry to meet the challenges and competitiveness.

Effective training and related seminars for practicing professionals, senior executives involved in the AECO industry and finance people are important as they play an important role to drive and support the industry forward. There are many advanced building technologies & application tools, new procurement methods & supply chain management and best practices available locally and overseas that we can learn and apply to boost our productivity, enhance quality, reduce waste, improve safety and achieve sustainability for construction projects. The vision, commitment and effort allow us to move towards a brighter future of the industry and of Hong Kong.

3.3 Purposes of Developing the Campus

With the background above, participants of this Competition are required to develop a campus to meet the training needs of the industry with the following objectives:

1. Support training programme, conference and networking;
2. Present with demonstrations and displays of innovative ideas and construction technologies;
3. Learn & apply the most advanced knowledge and best practices of design and construction techniques and technologies with safety in mind;
4. Foster collaboration and engagement in different processes; and
5. Promote sustainability of built environment.

3.4 Target Users in the Campus

The target users will be building practitioners, professionals, executives of entrepreneurs in the AECO industry. The Campus will enrol 500 visitors with guest house facilities.

3.5 Site Selection and Assumptions

The Site selected is currently used by HKIC as a Trade Testing Centre (TTC) located at 95, Yue Kwong Road, Aberdeen, Hong Kong. It is assumed that the TTC will be relocated and the existing building will be converted or demolished for other purposes.

For the purpose of this Competition, the following development parameters will be used as reference:

Class of Site: N/A

Permitted Plot Ratio (PR): N/A

Permitted Site Coverage (SC): N/A

Site Area: 8,833 m²

Existing Construction Floor Area (CFA): 22,151 m²

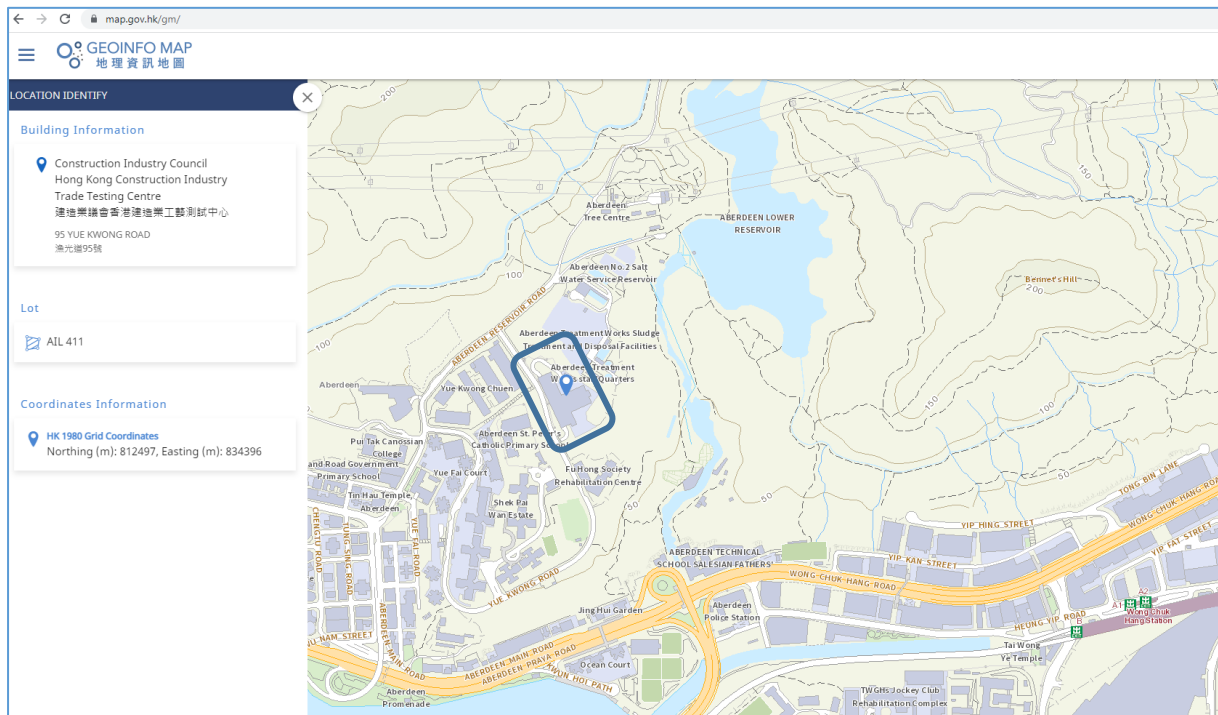
Permitted building height under lease conditions: Design, Disposition and Height (DDH) Clause which means the building to be erected on the lot shall be subject to the approval in writing of the Director of Buildings.

Existing building height (in number of storeys): 11

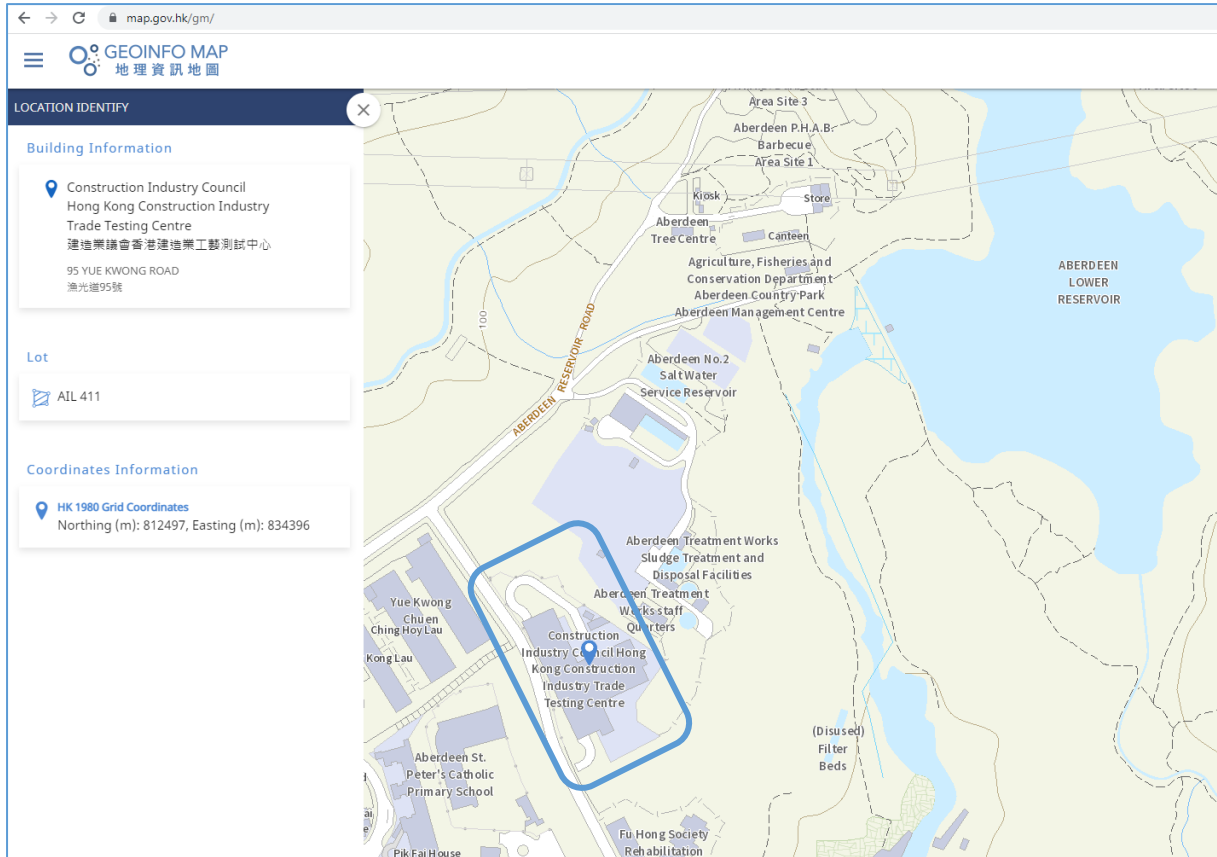
Existing Height of Building under approved building plan: + 125.4 above Hong Kong Principal Datum (HKPD).

For the purpose of this Competition, the building(s) to be proposed should not exceed the existing height of building structures.

3.5.1 Location Map



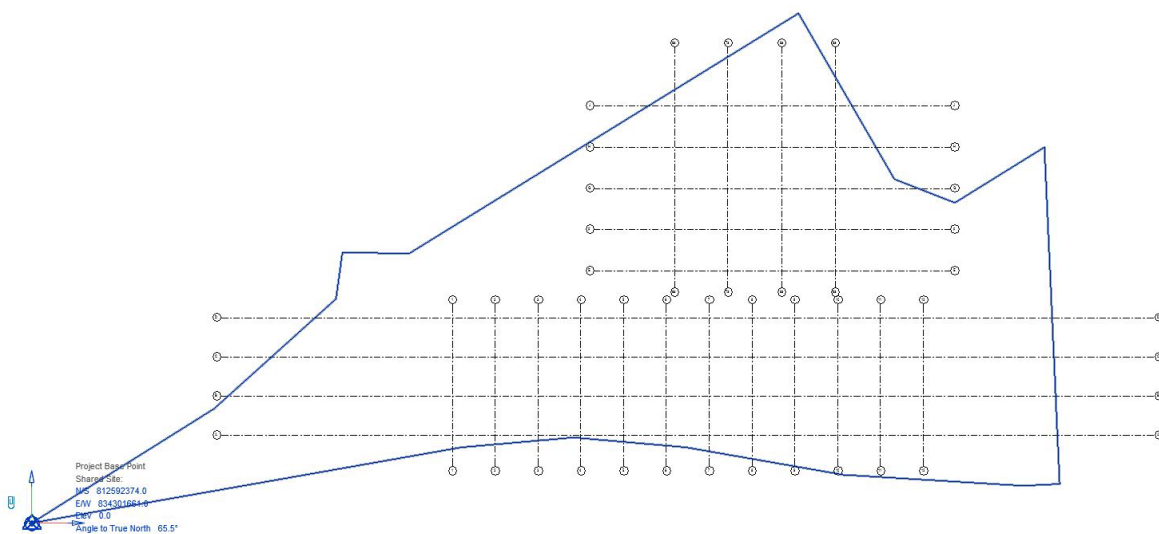
3.5.2 The Site



3.5.3 Footprint of the existing TTC (for reference)

Site boundary lines (in blue colour) are indicated in the figure below.

(Note: Angle to True North = 65.5°)



3.5.4 Images of the existing TTC (for reference)



3.5.5 Basic BIM model

Successfully registered participants will be provided with a basic BIM model (information model) in .ifc format (an openBIM format) indicating the site boundary and the basic layout of the site surrounding context.



Angle to True North = 65.5°

Project Base Point = Survey Point:

N: 812592374.0

E: 834301661.0

Finishing Floor Level (F.F.L.) at Level 'L0' at the Main Entrance of the TTC = + 66.4m above Hong Kong Principal Datum (HKPD).

The basic BIM model may include any building elements (BIM objects) within the site boundary, such as pavements, ramps, roads, floors / slabs, columns, beams, façade, etc., for reference by the participants. Participants shall check the parameters / properties of the building elements (BIM objects) for identification.

Participants are required to adjust this Basic BIM model after loading it into BIM authoring software. Adjustments include the Project Base Point, Survey Point, Orientation and Elevation.

3.6 Spatial Requirements - Schedule of Accommodation (SOA)

The spatial & provisional requirements are listed below:

A. Campus

Space / Facilities	Net Operational Floor Area (NOFA) in m ² (each)	Qty	Features / Provisions
Lounge / Reception	600	1	Reception, foyer gathering & seating areas Lounge area for 70 - 100 users
General Display / Gallery	400	1	General display areas
Academic & support Staff - Office & Meeting	700	2	General administration & support staff, academic full-time / part-time staff and meeting, cater for 100 staff
Board Room	150	1	Executive meeting
Large Exhibition Space	1,000	6	Include external construction space for MiC, large 3D printing, robotic automation, 3D fabrication, laser cutters, drones, etc. Provisions should allow enough headroom for hoisting equipment, large components, such as modular panels, structural components, etc.
Laboratories / Workshops	50-100	20	Different zones for various technologies, such as CAVE, VR, Immersive Studio, RFID, laser scanning, R&D, etc.
Computer Labs	100	8	R&D, simulations, AI, mobile applications
Lecture Theatres	400	2	For moderate size lectures
Class Rooms	100	10	Teaching & learning facilities
Multi-Purpose Hall	800	2	For large seminars & conference
Information Resources Library	500	2	Collections, reading, library facilities (include individual study tables, computer workstations, quick access terminals, service counters)
IT/Computer Server Room	100	2	Computer equipment, data processing
Print Rooms	50	2	Printing materials
Dining Hall (for shared use with guest house)	500	2	Dining and kitchen facilities, for example, provision of food preparation, wash up, servery, display and point of sale, staffing change room and store
Cafe	200	1	Cafeteria, internal & external seating
Medical Room	50	1	For emergency treatment with first aid facility

B. Guest House

Space / Facilities	Net Operational Floor Area (NOFA) in m ² (each)	Qty	Features / Provisions
Guest House - Reception	200	1	Reception, foyer gathering & lounge seating area, small exhibition area.
Guest House – Room (ensuite)	15	30	Rooms need to be fully finished with furniture, e.g. bed, bedside table, desk with drawers, wardrobe, chairs, bookshelves, etc. Toilet includes WC, basin, shower and shelf.
Guest House - Pantry Facilities	50	one per floor	Pantry facilities with necessary provision, for example oven, microwave, cooker, refrigerator, sink, etc. for light cooking. Space to furnish with cupboard, table and chairs.
Guest House - Common Areas	50	one per floor	Facilities include television and sofas, vending machine for snack & drink, photocopying machine.
Cafe	100	1	Cafeteria, internal & external seating
Guest House - Laundry Room	40	3	Washing machines and dryers, seating.
Guest House - Cleaner Room	6	one per floor	Storing cleaning material
Guest House - Management Office	80	1	Office facility, for example, provision of working desks, file cabinets, chairs, and bookshelf.
Refuse Collection Chute	6	one per floor	With side entry and top hopper

C. Ancillary Facilities

Space / Facilities	Net Operational Floor Area (NOFA) in m ² (each)	Qty	Features / Provisions
Sports Hall	*	1	One Basketball court (can be converted into 4 badminton courts) 2 Table tennis, 2 squash courts, toilet & changing, etc.
Refuse Collection Chamber	80	1	Refuse containers and recycle storage bins
Parking Space	*	20	Parking provisions for staff and visitors including facilities for disabled residents
Loading & unloading Dock	*	5	Loading Dock - Deliveries for materials, equipment, and access for refuse collection vehicles
Back House Storage	*	*	Storage space for equipment, building components -structural & modular panels
Plant rooms	*	*	Transformer, switch rooms, pump rooms, air handling units etc.
Landscape Area	*	*	Planting areas, roof garden, vertical planting, outdoor seating areas

Asterisk (*) means as appropriate

Maximum allowable variation of the above spatial requirement is limited to $\pm 10\%$.

Structural provision: To accommodate architectural layout, usage and suit general structural requirements.

Building services provision: Artificial lighting with promoting use of daylight, A/C provision (centralised or split type), sprinkler system, plumbing (including heated water supply) and drainage system, power and gas supply, and mechanical ventilation for toilet.

3.7 Competition Proposal

Participants are required to convert the existing site and the building of the CIC Trade Test Centre (TTC) in Aberdeen, Hong Kong into a new Construction Innovation Campus (CIC).

The site together with the proposed building(s) and facilities should be developed into a pleasant environment for learning, exhibiting and socialising with accommodation (Guest House) for short stay of overseas speakers / lecturers and visitors.

The provisions in the Campus should include training and conferencing facilities, exhibition space and booths for showcasing the innovation technologies and applications. Training programmes will cover planning, design, construction and operations in project development

lifecycle with learning outcome for driving AECO business transformation. It is expected through the organising training events, showcasing of exhibits and building social network will help the industry stakeholders to motivate changes in their organisations / workplaces and work processes so as to enhance construction productivity & efficiency, reduce waste, promote green construction, site safety and ensure quality of deliverables and hence to achieve overall quality of projects and sustainability in our built environment.

The proposal should be generated from the use of BIM tools with Common Data Environment (CDE) for information management using BIM as a collaboration platform throughout the development of the design proposal.

3.8 Design Approach and Collaboration Platform

As the theme emphasises on sustainable design with use of BIM, participants are required to demonstrate the application of sustainable strategies in their submissions. In any options, demolishing the whole or partially the existing building, participants are required to justify carbon emissions performance with the CIC Carbon Assessment Tool (CAT). Planning & passive design approach with DfMA - kit-of-parts, MiC, MiMEP are strongly encouraged. OpenBIM for design coordination and the adoption of CDE for information management using BIM for team collaboration are required to demonstrate the combination of methodologies and tools for delivering the best sustainable design solution in their proposals.

3.9 The Challenges and Requirements

Participants are required to submit innovative proposal to be generated from use of BIM tools and related tools throughout the development process. The proposal should be able to demonstrate the following:

3.9.1 Planning & Design Solution

- Plan and design with people-technology objective and promote a sense of learning experience with aims to strengthen social interaction amongst AECO stakeholders. The overall design should respect predominant local surroundings, and give a sense of place with innovative ideas.
- Adopt Passive Sustainable Design towards advancing net zero carbon and ensure all sources of emissions, including embodied carbon are addressed.
- Provide an overall design that would be economically viable and efficient to build with the use of MiC, DfMA and MiMEP. (See below)
- Provide design of modules and use of materials.
- Document to include the design development plan using BIM and related technologies, BIM workflow, and project milestones in the BIM Execution Plan (BEP) from the beginning throughout the design process.

3.9.2 Passive Sustainable Design

Below is a reference of measures in addressing passive sustainable design. Analysis and illustration utilising BIM model for any proposal passive sustainable design elements should be demonstrated:

- Building massing design
- Building orientation and building openings
- Basic selection of building materials
- Application of building elements like sun shading devices, wind catchers, etc.
- Other means of passive sustainable design (not exhaustive)

3.9.3 Modular Integrated Construction (MiC)

MiC is an innovative construction method. By adopting the concept of “factory assembly followed by on-site installation”, MiC helps to ease some of the current challenges faced by the local construction industry. In this method, free-standing integrated modules (completed with finishes, fixtures and fittings) are manufactured and assembled in a factory. By transferring on-site construction processes to a controlled factory environment, buildings can be substantially completed off-site. The adverse impacts of weather conditions, scarce labour resources and site constraints can all be substantially reduced. MiC provides a great degree of production quality control, and can improve construction productivity, safety and sustainability. MiC units can be adopted for different areas of the development, such as classrooms, guest house facilities, and recreational facilities. MiC units shall include MiMEP.

3.9.4 Design for Manufacture & Assembly (DfMA)

DfMA is an eco-digital design approach focusing on ease of manufacture and efficiency of assembly. DfMA enables offsite manufacture of high-quality construction components and efficient assembly of the components on site. With the supply chains building up around components and systems, DfMA accomplishes significant improvements in productivity, safety, quality and sustainability. Applying DfMA enables identification, quantification and elimination of waste or inefficiency in product manufacture and assembly to achieve lean construction. It also minimises the risk of site accidents and a well-planned offsite logistics helps reducing the number of vehicle movements for staff and material improving safety in the site locality.

Participants are required to demonstrate the approach and use of MiC and MiMEP in their designs by choosing designated areas, such as a guest room and an exhibition booth, and develop details in the BIM models showing the installation works of mechanical, electrical, plumbing and lighting fixtures with necessary supporting components including hangers, firestops, etc. Participants can refer trade catalogues available in the market, and illustrate how they could apply to achieve flexibility, modularity and prefabrication in design and build optimisation using design tools. Briefing and relevant training on how to use available design tools will be provided by the CIC.

3.9.5 Multi-trade integrated MEP (MiMEP)

DfMA is a design approach for effective construction project delivery, while MiMEP is an emerging trend in construction projects for adoption of DfMA for Mechanical, Electrical and Plumbing (MEP) components and equipment by integrating them into a sub-assembly off-site (such as MiC units and other areas of the development) and then deliver to and installed on site.

3.9.6 Buildability and Logistics Planning with Use of DfMA, MiC & MiMEP

Given the benefits of using DfMA / MiC / MiMEP approach, participants are recommended to adopt the technologies for building components (kit-of-parts or modules) in the proposed design. The study and application in using the approach can include the study of buildability and transportation logistics:

- 1) 4D modelling: to demonstrate buildability and transportation logistics of DfMA / MiC / MiMEP design, through the use of BIM construction simulation.
- 2) Logistics planning: to identify critical junctions during the process of modules transportation from the factory to the site, through routing study/investigation.

3.9.7 Embodied carbon calculation and optimisation using the CIC CAT

In support of the Government's Climate Action Plan 2050, which set out the vision of "Zero-carbon Emissions•Liveable City•Sustainable Development", and outlined the strategies and targets for combating climate change and achieving carbon neutrality, sustainable design and construction are critical. Participants are required to evaluate embodied carbon in their design using the CIC CAT, calculation and design optimisation on **(i) Concrete, (ii) Structure Steel and (iii) Reinforcement Bar, if any**, are required. Briefing and training on how to use the CIC CAT will be provided by the CIC.

Each participating team will have to create a project account on the CIC CAT website, and input relevant data generated from BIM models into the CIC CAT website for calculating embodied carbon, and obtain the results and form part of this Competition submission. Participants are required to prove their designs are optimised by comparing the initial designs and the final designs on the use of **(i) Concrete, (ii) Structural Steel and (iii) Reinforcement Bar, if any**. For simplicity in this Competition, concrete from different construction methods (e.g. Façade / In-situ Concrete / Precast Concrete, if any) may be grouped as 'Concrete' for calculations on the CIC CAT; Prefabricated Structural Steel and Structural Steel may be grouped as 'Structural Steel'; Reinforcement Bar and Prefabricated Reinforcement Bar may be grouped as 'Reinforcement Bar' for calculations on the CIC CAT.

CIC CAT website and login: <https://cat.cic.hk/>

Self-learning tutorial and user guide: <https://cat.cic.hk/Landing/HowToUse>

3.9.8 Innovative Design through Collaboration

Collaborative design is a process that team members bring together different ideas and work together for a common goal to achieve the intended purpose. Innovative design through collaboration requires participants to demonstrate how they collaborate to design with the adoption of BIM tools and process. The participants shall generate the design through maximising usage of BIM and its collaboration platform. The adoption of CDE for information management using BIM is required as a collaboration platform to demonstrate good project collaboration and coordination, including documentation for tracking design, construction activities and archiving information for next projects.

3.9.9 Creative BIM Uses

In this Competition, the CIC aims at promoting BIM as an effective design, collaboration and integrated review tool in achieving better design quality. Uses of BIM are listed in the CIC BIM Standards - General (2021) as follows:

- 1) Design authoring of core disciplines/ building systems
 - Possible use of generative design in BIM
 - Explore design options and optimise design resolution
- 2) Design reviews
- 3) Existing conditions modelling
- 4) Sustainability evaluation and Site analysis
 - BIM-based study on environmental impacts to the site and building design, and passive sustainable design in addressing such impacts
- 5) 3D / Spatial coordination
- 6) Space layout and programming
- 7) Engineering analysis defined as advanced BIM use
- 8) Digital Fabrication
 - Design for Manufacture and Assembly (DfMA)
 - Modular Integration Construction (MiC)
 - Multi-trade integrated MEP (MiMEP)
- 9) BEP - Check Section 6.1 for details
- 10) CDE for information management using BIM

Participants are required to adopt any other BIM Standards and Guidelines published from the CIC and are encouraged to make best use of the BIM Objects available from the CIC's BIM Portal (https://www.bim.cic.hk/en/resources/bim_objects) whenever possible.

3.9.10 Use of BIM Software and CDE for information management using BIM

Participants are required to use a minimum of two (2) BIM authoring (modelling) software (e.g. Architectural model using software A meanwhile Structural model using software B; Architectural model using software C while MEP model using software D). Participants are

encouraged to design in BIM rather than 2D CAD software. There is no preference of specific BIM software and BIM Cloud Collaboration Platform (also known as CDE for information management using BIM) in this Competition. However, participants are encouraged to explore different available solutions and apply those they consider appropriate for their design and collaboration. When sharing the BIM models, participants need to consider the following challenges, like:

- 1) BIM model and data compatibility and interoperability between BIM software
- 2) BIM Model sharing method
- 3) Data assess and security control
- 4) Revision and version control

In the submission files such as the presentation slides, poster and video, participants are required to:

- 1) Provide a list of the software (BIM, GIS and sustainable design analysis tools, with their version) and CDE used in this Competition.
- 2) Prove the uses of the software (BIM, GIS and sustainable design analysis tools) and CDE by capturing the design development, design coordination, energy analysis, and collaboration, etc.) within the relevant software user interface.
- 3) Prove the uses of CDE by showing the adoption of relevant standards and workflow as specified in the CIC BIM Standards - General (2021), which aligns with ISO19650's Information Management principles, workflows and requirements.
- 4) Prove the uses of sustainable design analysis tools by showing the iteration process of computational design, engineering, analysis and optimisation.

3.9.11 openBIM Approach

Participants may consider openBIM approach for cross BIM software collaboration. Reference can be made to the Industry Foundation Classes (.ifc) data. ifc is a platform neutral, open file format specification that is not controlled by a single BIM software. It is an object-based file format with a data model developed by buildingSMART International to facilitate interoperability in Architecture, Engineering, Construction, Operations and Owner (AECOO) industry, and is a commonly used collaboration format in BIM based projects.

3.9.12 Use of spatial data available at Hong Kong GeoData Store or Common Spatial Data Infrastructure (CSDI)

Participants are encouraged to make use of spatial data from the Hong Kong GeoData Store or CSDI for facilitating their design planning and developments.

4. About the existing CITAC

Official website of CITAC: <https://citac.cic.hk/en-hk>

Construction Industry Council (CIC) has been at the forefront of adopting advanced technology and promoting wider adoption of technological tools to innovate industry practices. As one of the CIC's sustainable initiatives, CITAC is established to promote the application of innovative techniques and solutions in the local construction industry with a view to providing the industry with cutting-edge information on home grown and overseas-developed building technologies. Currently **CITAC** is located in the CIC-Zero Carbon Park, Kowloon Bay and it occupies around 5,000 square feet of an exhibition area with over 40 innovative technologies currently on display. The exhibits are divided in six zones as follows:

- **Advanced Construction Material** - It showcases Self-Compacting Backfill Materials, Carbon Neutral Paving Blocks, Triple-Proof Stitching System, etc.
- **Advanced Tools and Equipment** - It showcases VR for Twin-Path Lift Sling, BIM-Based Automated Setting-Out Robot, Laser Scanning for Construction, Exoskeleton, Construction Energy Storage System (CESS), etc.
- **Automation and Robotics** - It showcases VR for the robotics.
- **Digitalisation** - It showcases "Digital Twin" - Intelligent Management Platform for Smart Construction and Facility Projects, Smart Building - Indoor Pathogen Prediction and Control, BIM Visualisation, etc.
- **Sensors & IoT** - It showcases IoT Safety Helmet, Non-Destructive Testing Method for Concrete Maturity, Machinery Anti-collision Camera, Solutions for Facility Management, etc.
- **Advanced Technology Solutions** - It showcases VR for Construction Safety Training, AR, Mixed Reality Helmet, AI for Site Safety, etc.

5. Reference

- 1) Development Bureau's Technical Circular (Works) No. 2/2020: MiC
<https://www.devb.gov.hk/filemanager/technicalcirculars/en/upload/375/1/C-2020-02-01.pdf>
- 2) Buildings Department's Practice Note for Authorised Persons (ADV-36): MiC
<https://www.bd.gov.hk/doc/en/resources/codes-and-references/practice-notes-and-circular-letters/pnap/ADV/ADV036.pdf>
- 3) Buildings Department's Pre-accepted MiC Systems / Components
https://www.bd.gov.hk/en/resources/codes-and-references/modular-integrated-construction/mic_acceptedList.html
- 4) General information on DfMA and MiC issued by the CIC
<http://www.cic.hk/eng/main/mic/>
http://www.cic.hk/eng/main/dfma_alliance/
- 5) Reference Material on Adopting DfMA for MEP Works (A Concise Guide) (August 2022)
[https://www.cic.hk/files/page/51/Reference%20Material%20on%20Adopting%20DfMA%20for%20MEP%20Works%20\(A%20Concise%20Guide\).pdf](https://www.cic.hk/files/page/51/Reference%20Material%20on%20Adopting%20DfMA%20for%20MEP%20Works%20(A%20Concise%20Guide).pdf)
- 6) Reference Material on Use of Digital Technologies for QA/QC of MiC Modules in MiC Factories (June 2022)
[https://www.cic.hk/files/page/51/20220616%20Use%20of%20Digital%20Technologies%20for%20QAQC%20of%20MiC%20Modules%20\(final\).pdf](https://www.cic.hk/files/page/51/20220616%20Use%20of%20Digital%20Technologies%20for%20QAQC%20of%20MiC%20Modules%20(final).pdf)
- 7) Reference Materials - Logistics and Transport for MiC Projects (December 2021)
<https://www.cic.hk/files/page/51/202111214%20Logistics%20%26%20Transport%20for%20MiC%20Projects.pdf>
- 8) Adopting MiMEP - From the Government's Perspective issued by the ArchSD:
https://mic.cic.hk/files/Education/5/File/Adopting_MiMEP_%E2%80%93_From_the_Government%E2%80%99s_Perspective.pdf
- 9) Common Spatial Data Infrastructure (CSDI)
<https://csdi.gov.hk/>
- 10) Hong Kong GeoData Store (alpha version of CSDI Portal)
<https://geodata.gov.hk/gs/>
- 11) Geospatial Lab
<https://csdigeolab.gov.hk/en/>
- 12) CIC BIM Standards - General (Version 2.1 - 2021)
https://www.bim.cic.hk/en/resources/publications_detail/100
- 13) CIC BIM Standards Architecture and Structural Engineering (Version 2.1 - 2021)
https://www.bim.cic.hk/en/resources/publications_detail/115
- 14) CIC BIM Standards for Mechanical, Electrical and Plumbing (Version 2 - 2021)
https://www.bim.cic.hk/en/resources/publications_detail/110
- 15) CIC BIM Standards for Underground Utilities (Version 2 - 2021)
https://www.bim.cic.hk/en/resources/publications_detail/111
- 16) CIC Production of BIM Object Guide - General Requirements (2021)
https://www.bim.cic.hk/en/resources/publications_detail/112
- 17) CIC BIM Dictionary (2021)
https://www.bim.cic.hk/en/resources/publications_detail/113

6. Submission and Deliverable Requirements

6.1 Round 1 - Online Submission and Requirements

All submission files shall be archived in CDE and are readily available for retrieval by the CIC and the judging panel for assessments.

1) Presentation slides

The slides shall document and present the following:

- Design concept and approach to site planning and building design issues.
- Compliance of spatial requirements - SOA with justification by the use of automatic area calculation in BIM software. Area schedules comparing between the proposed design and the spatial requirements - SOA.
- Creative BIM uses.
- Illustration of the use of Modular Integration Construction (MiC), Design for Manufacture & Assembly (DfMA), Multi-trade Integrated MEP (MiMEP).
- Quantity schedules of major building systems and components including but not limited to MiC units generated from BIM models.
- Workflow and deliverables of adopting CDE for information management using BIM as a collaboration platform throughout the development process.
- Passive sustainable design being adopted, and justification through daylight study, solar shadow study, (optional: energy model and analysis, natural ventilation simulation as advanced BIM use), etc.
- Prove sustainable designs and design optimisation by showing the iteration process in software.
- Prove embodied carbon calculation and optimisation by comparing the initial design and the final design using the CIC CAT.
- Information of team organisation, division of work, list of BIM software used (with version) & platform for collaboration, diagram to illustrate the data transfer among various BIM software , etc.
- Maximum 20 pages in English.
- PowerPoint slides in .ppt or .pptx formats. Please refer to the Template provided (CIC_BIM_Competition_2023_Submission_Slide_Template.pptx).

2) Posters

- The posters should identify the key points in design and how BIM is applied in design process collaboratively to achieve design challenge.
- 4 nos. of A1 size and portrait orientation layout in English.
- Minimum resolution 200 dpi.
- Electronic format in .jpg or .png.
- Please refer to the Template provided (Document: CIC_BIM_Competition_2023_Submission_Poster_Template.pptx).

3) Video

- To demonstrate design concept and development, BIM implementation in design visualisation (walk-through with material indication), team collaboration, BIM coordination process, creative BIM uses, MiC, DfMA and MiMEP, passive sustainable design, design analysis, simulation and optimisation, etc.
- Maximum 2.5 minutes.
- Electronic format of video in .avi or .mpeg format, with annotation/sub-title and music, and voice-over (optional).

4) BIM models (Information model)

- Modularity of DfMA, MiC, MiMEP approaches.
- BIM models shall include all geometries of the design, relevant information embedded in building elements, different views, images, area schedules comparing between the proposed design and the spatial requirements - SOA, quantity schedules of major building systems and components including but not limited to MiC units.
- All BIM models in both native file format and open format (.ifc) shall be collaborated in CDE.

5) Pre-appointment BIM Execution Plan (BEP)

- To develop a pre-appointment BEP according to the required contents as specified in the Section 'Pre-appointment BEP Content' of the CIC BIM Standards - General (2021).
- Please refer to the Template provided (Document: CIC_BIM_Competition_2023_Submission_PreAppBEP_Template.docx).

6) Scripting (optional)

- To showcase computational design, engineering, analysis and optimisation, which will be defined as one of the advanced BIM use.
- A verifiable script in Dynamo, Grasshopper, Generative Component or other computer language scripting applied.

6.2 Round 2 - Onsite Competition Format and Requirements

- 1) To incorporate CIC's design changes in onsite competition, such design changes requirements and details will be announced on the day of Round 2 competition.
- 2) Onsite update of models and production of required output (including presentation slides) in 12 hours (9:00 am to 9:00 pm).

- 3) A max. 25 pages PowerPoint slides in English in .ppt or .pptx format (an update on top of those to be submitted in Round 1 showing the changes for Round 2).
- 4) 4 nos. of A1 Posters in English with at least 200dpi in .jpg or .png, layout in portrait format (an update on top of those to be submitted in Round 1).
- 5) A max. 2.5 minutes video to demonstrate design concept and development, BIM implementation in design visualisation (walk-through with material indication), team collaboration, BIM coordination process, creative BIM uses, MiC, DfMA and MiMEP, passive sustainable design, design analysis, simulation and optimisation, etc. (an update on top of those to be submitted in Round 1). Video in .avi or .mpeg format, with annotation/sub-title and music, and voice-over (optional).
- 6) BIM models shall include all geometries of the design, relevant information embedded in building elements, different views, images, area schedules comparing between the proposed design and the spatial requirements - SOA, quantity schedules of major building systems and components including but not limited to MiC units (an update on top of those to be submitted in Round 1). All BIM models in both native file format and open format (.ifc) shall be collaborated in CDE.
- 7) A pre-appointment BEP (an update on top of those to be submitted in Round 1).
- 8) A verifiable script in Dynamo, Grasshopper, Generative Component or other computer language scripting applied, if any, in this Competition to showcase computational design, engineering, analysis and optimisation (an update on top of those to be submitted in Round 1).
- 9) Presentation sequence will be based on drawing lots on the spot.
- 10) Presentation in 15 minutes and followed with a Q&A session hosted by the judging panel for 5 minutes.

6.3 Online Submissions

- 1) Registration will be opened until 3 February 2023 (deadline for registration), unless waiver is granted by the CIC. Successful registration will be notified via email by the CIC.
- 2) For submission, Participant is required to self-create a Google account and store the requested deliverables (refer to Section 6.1) in the Google Drive, and email the shared Google Drive link by 1 June 2023 (12:00nn HK time) to bim@cic.hk

7. Guidance and Support

Competition Briefing Webinar

- Date: Mid of Dec 2022

Supporting BIM Partners

- ACID – IM-CDE
- AMBIT – SkylineGlobe system
- Autodesk – BIM 360 and Dynamo
- Bentley – ProjectWise, OpenRoads Designer, OpenBuildings Designer and Synchro
- BIMSONS - Bimsync
- BIMTrack
- Bricsys – BricsCAD
- CivilConnect
- Esri – ArcGIS
- Forida – Enscape
- GeoSys – SuperMap
- Graphisoft – ARCHICAD
- GVDC – Ecodomus
- IES – IESVE
- isBIM – Jarvis
- Kalloc – Fuzor
- Llewellyn & Partners Co. – AutoCDE
- MES – ShareBIM
- Oakley – BIM eLearn
- Trimble – Tekla
- Vircon
- White Frog
- Hilti - Profis MSE
- **XX**
- **XX**
- Training webinars and free software licenses will only be arranged for participating teams

BIM Mentoring Support

- Mentors from the CIC-Certified BIM Manager (CCBM), CIC-Certified BIM Coordinator (CCBC), Members of HKIBIM and HKABAEIMA (including HKICBIM, HKGISA) and buildingSMART Hong Kong Chapter
- Mentoring support will only be arranged for participating teams

8. Assessment Scoring Criteria

Scoring Criteria	%
1st Round	
Use of Information and Compliance of Client's Requirements	25
Computational Design, Engineering, Analysis and Optimisation	25
Creativity, Innovation & Technologies, Originality	25
Communications and Presentation Skills	25
TOTAL	100
2nd Round (On-site competition)	
1 st round score	20
Compliance to Design Information, Flexibility & Responsiveness	30
Collaboration & Teamwork	20
Communications and Presentation Skills	20
Creativity, Innovation & Technologies, Originality	10
TOTAL	100

9. Awards and Prizes

Prizes	
First Prize	Plaque + Certificate A Chance to Participate in an Overseas Inspiration
Second Prize	Plaque + Certificate
Third Prize	Plaque + Certificate
Max. 7 Merits	Certificate
All	E-Certificate of Participation E-Certificate of Attended Training Webinars

10. Terms and Conditions

By participating in this Competition, each team shall make a registration to participate in this Competition, refer as the “Participating Team”, and each Team Member unconditionally accepts and agrees to comply with and abide by the Terms and Conditions in the Design Brief and the decisions of the CIC, which shall be final and binding in all respects.

10.1 Registration

- 1) No registration fee is required. The registrants are solely responsible for their own expenses in preparing all submissions and deliverables.
- 2) Eligibility: The participants shall be studying a full-time undergraduate or postgraduate program in a registered higher education institution in Hong Kong, or pursuing a part-time top up degrees, as of the 3 February 2023. For overseas students, only of those who hold a valid Hong Kong Identity card is eligible for the participation. There is no limit to the number of participating team to register this Competition.
- 3) Every participant is restricted to joining 1 team only for this Competition.
- 4) Each Participating Team shall have 3 to 6 members (including the team leader), with students from minimum 2 construction-related disciplines (including, but not limited to, Architecture, Civil/Geotechnical Engineering, Building Services Engineering, Environmental Engineering, Surveying, Construction, Building and Real Estate, Urban Planning and other construction-related disciplines). [*NOTE: For those who may not be able to form a multi-disciplines team, they may also register before the due date, and the CIC will assist them to form teams if necessary.]
- 5) The staff of the CIC and their families are not allowed to participate in this Competition.
- 6) Each Participating Team is encouraged to attend the briefing, online training and hands-on training webinars, if any, organised by the CIC or its representative or supporting organisations.
- 7) The participants are required to update the CIC for replacement or update on members and to submit the new name list latest by the deadline for registration.
- 8) Only the registered team members who completed the full submissions to this Competition are qualified to receive the electronic certificates of participation.
- 9) The CIC has the final decision on the eligibility of the participants and reserves the right to reject any participant who does not meet the eligibility criteria.
- 10) The CIC reserves the final decision on this Competition and has the right to cancel and/or modify any terms and conditions at any time in this Competition without prior notice.
- 11) The CIC reserves the final decision on this Competition and has the right to cancel or change the awards and other arrangements for this Competition without prior notice.
- 12) The participants shall bear full legal and related responsibilities arising from any possible breach of intellectual property rights in respect of their registration and

competition, and shall indemnify the CIC and other concerned parties against any claims and liabilities arising from any such breach.

- 13) All participants who submit registration to this Competition, agree to assign the intellectual property rights of their designs to the CIC on promotion, exhibition, demonstration and training purposes both locally and internationally.
- 14) If a participant is found to have disposed to a third party, such as by assignment, transfer or provision as security, or is making registration procedures, etc., for all or any part of the intellectual property rights or any other rights concerning the submitted registration after the submission, the submission will be made invalid.
- 15) All works must be original works of the participant. The registration will not be shown in other competitions or published. Participants are required to indicate that they are not infringing upon the rights (including design rights and copyright) of the submission.
- 16) Any teams are subject to investigations regarding originality and eligibility for Intellectual Property Rights, design rights or copyright registration. If they do not comply with the requirements, the CIC has the sole discretion to disqualify and forfeit the prizes involved without any liability to the selected participants or any other persons, and other Participating Team may be selected as the winner.
- 17) Participants are required to agree to the CIC's publication of their name and authorise the CIC to collect, process and use their personal data for the event's liaison and promotion. All materials are kept strictly confidential except for the above purposes.
- 18) If any participant provides incorrect, incomplete or inaccurate information, or violates any registration terms or conditions of this Competition, the CIC has the final decision to cancel such participant's qualifications and reserves the right to withdraw the relevant awards.

10.2 Pre-Competition

- 1) The Participating Teams shall complete this Competition at their own premises for the first round.
- 2) For the second round, the Participating Teams shall bring along their own computers and software, they are advised to take all necessary precautions to ensure that the competition areas, equipment and machines are safe for use by the team members. The CIC shall not be held responsible for any accidents, damages or mishap that may happen to the participants during the competition.
- 3) Participants may use any BIM authoring software or tools. It is recommended that the BIM authoring software or tools and other supporting analysis / simulation software or graphic and presentation tools for this Competition to be openBIM compliant including the support of import and export files in Industry Foundation Classes (.ifc) format.
- 4) Participants will be notified through email if any changes incurred on submission or presentation time and venue.

- 5) The event will be cancelled if a No. 8 typhoon signal or above is hoisted or the black rainstorm warning signal is raised three hours prior to the original start time of the event. The event will be then re-scheduled to the next available date.

10.3 During Competition

- 1) All participants must comply strictly with all terms and conditions of this Competition defined by the CIC. The Judges and the CIC reserve the rights to disqualify any participant if he/she suspects, in its sole discretion, that the participant did not follow any terms and conditions.
- 2) Failure by the participant to comply with instructions given by the Judges or the CIC, or participants caught in cheating and not producing genuine works, may also incur loss of score. Continuous violation of any terms and conditions, may result in suspension or termination from this Competition.
- 3) The participant shall report to the CIC / Judges as soon as possible, if any grievances. Appeals after this Competition will not be entertained. The Judges' decision shall be final.
- 4) Any participants from the shortlisted team must inform the CIC as early as practicable if he/she could not participate on the day of the second round competition.
- 5) No replacement of any team member is allowed due to whatever reasons. The same full team shall participate the second round competition for the best result, however, minimum one member of a team can still proceed the second round competition.
- 6) The participants shall bring along their own computers with all necessary software and tools with legal licenses to the competition venue for the completion of the competition.
- 7) Any illegal stuffs such as un-authorized software licenses are prohibited. The competition venue with power supplies and power extension cord will be provided by the CIC. Internet connection will not be provided by the CIC for the second round competition. The participants shall arrange and provide their own internet connection if there is a need.

10.4 Assessment and Judging

- 1) The submissions are assessed based on the assessment scoring criteria.
- 2) The results of this Competition will be decided by judging panel and are final. There is no mechanism to appeal or object.
- 3) The judging panel will be composed of representatives of the CIC and the industry BIM experts.
- 4) The panel of Judges shall abstain from evaluating a team where there may be conflict of interest issues. In such a case, the chief judge to be elected by the panel shall make the final decision.
- 5) Assessment shall not be done in the presence of the participants.

- 6) If any stated prizes are unavailable, the CIC reserves the right to substitute one or more items, in its sole and absolute discretion. No prize is exchangeable, transferable, or redeemable for cash.

10.5 Post-Competition

- 1) All submissions will not be returned, and the participant agrees to authorise the CIC to modify, use, reproduce, publicly display or display the registration on the Internet or other media for promotional purposes without prior obtaining the participant's agreement or pay royalties to them.
- 2) The CIC shall retain and hold exclusive rights for promotion, exhibition, demonstration and training purposes both locally and internationally. The exclusive rights include Intellectual Property rights, Design rights, Patent, Trademark, Copyrights, media rights, overall deliverables, including but not limited to the BIM models, posters, reports, multimedia, scripts, materials and projects created and submitted for this Competition.
- 3) All decisions made by the CIC and Judges are final. No correspondence or appeals shall be entertained.
- 4) The top three prize winners and the merit winners may be invited for joining in CIC's coming events and activities.

~ THE END ~