Location Plan 1:2000

About the Traditional Housing using Modular Integrated Construction

Design Concept:
Our building layout design consists of buildings surrounding the open area. The layout provides a spacious yet cozy living areas with routes guiding pedestrians together, which promotes a sense of neighbourhood. Shops and activity rooms are available within the estate, providing convenient access for residents' living. A kindergarten is also available for the increasing number of young tenants moving into the area.

Building Form:
The multiple entries on the site allow a flexible flow for residents. The stairs and corridors are uniquely designed to allow sufficient ventilation and lighting in any area. The light tone and low building design also minimize the visual obstruction to the surrounding environment.

Spatial Arrangement:
The green garden area provides children's amusement park and benches for people to relax and hang out. For dormitory areas, units of the same size and features are grouped together, so that residents with similar family structures can interact with each other, forming a strong neighbour bonding. There are also study rooms and gym room for residents to relax and exercise. Shops like bakery and convenient store are also available for daily living.

Connectivity:
We designed a carpark near the car entry with about 10 parking spaces for loading/unloading and one refuse collection point. For the pedestrians, there are three entries for the site, they can also reach any point of the site following the clear routes in the park. For each block, there are sufficient stairs and multiple entries for people to reach the unit easily.

BIM Uses in Design, Collaboration, Engineering, Analysis and Optimisation:
First, we use Revit as our main platform for designing massing to estimate the area and position of each block, at the same time considering the area tolerance and block arrangement. We also use Tekla for building the construction of the corridors. The models are then analyzed to ensure proper beam placement. Eventually, TwinMotion is used to render the model.

BIM Collaboration approach:
Working as a team, all of our groupmates keep tracking the latest amendment by BIM 360, we work on architectural, structural and MEP files separately and link them back together. Zoom meetings were held regularly to exchange ideas and confirmed the progress. By having feedback from one another, we can optimize the decisions.

Quality of Design:
Revit Land Planning is used to ensure the area of open spaces fulfills the requirements. Revit Room Schedule is also used to monitor the room area to be within 10% tolerance. The use of TwinMotion and Naviswork facilitates the 3D visualization of our model.

Sustainability:
Rooftop solar panels can convert sunlight energy to direct current electricity to provide to the below residents, obtaining a pollution-free and renewable power. In each unit, there are also convective windows on the two sides of the window, maximizing the natural ventilation and sunlight. Moreover, steel MiC unit are able to be reused, units are flexibly moved.

MiC/ DfMA:
MiC units are adopted for all the residential units to speed up the construction duration. Since there are four major types of units, DfMA facilitates the assembly of the units. They can be transported to the site and installed efficiently.

Constructability:
Navisworks Manage was used to detect the errors between discipline. 4D simulation was also carried out for evaluating the project to prevent clashed, delays or cost overruns.

Summary:
BIM technology facilitates the building design and constructions, provides a holistic view and more precise data which traditional paper approaches cannot easily express. The BIM technology also able to analyse the data of simulated situation, like the method and estimated time to finish. Moreover, the BIM collaborating method also facilitates the cooperation between teammates and improves the working efficiency.

Conceptual Diagram: Siheyuan Design

**Overall Bird Eye view:** 1 Fung Nam Rd, Sheung Shui, New Territories .

Building Form and Space:
Buildings surrounding the open area

<Model Groups Schedule>

| | A | B | C | D |
	Type	Count	Reference Level	Workset
	1p unit	60	<varies>	<varies>
	2p unit	75	<varies>	<varies>
	2p unit 3	75	<varies>	<varies>
	3p unit	144	<varies>	Environment
	3p unit 2	144	<varies>	Environment
	3p unit 3	6	Level 0	Environment
	3p unit 4	6	Level 0	Environment
	5p unit	15	Level 0	Environment
	5p unit 2	15	Level 0	Environment
	B1 Lobby	1	Level 0	Environment
	B1 lobby 2	1	Level 0	Environment
	B1 lobby new	1	Level 0	Environment
	B1 study	1	Level 1	Environment
	B1 study 2	1	Level 1	Environment
	B2 lobby 2	1	Level 0	Environment
	B2 lobby new	1	Level 0	Environment
	B2 office	1	Level 1	Environment
	B2 office 2	1	Level 1	Environment
	B3 lobby 2	1	Level 0	Environment
	B3 lobby new	1	Level 0	Environment
	B3 lobby real	1	Level 0	Environment
	B3 management off	2	Level 0	Environment
	B3 Recycle	1	Level 1	Environment
	B3 Shop	2	Level 0	Environment
	B4 Lobby	1	Level 1	Blk04
	Dumpster	1	Level 0	Environment
	K-AdminOffice & Pan	1	Level 0	Environment
	K-ClassRoom	8	<varies>	Environment
	K-Covered Playroun	1	Level 1	Environment
	K-Game Room	1	Level 0	Environment
	K-Kids Female Toilet	1	Level 0	Environment
	K-Male Toilet	1	Level 0	Environment
	K-Medical Room	1	Level 0	Environment
	K-Music Room	1	Level 0	Environment
	K-Staff & Prin Office	1	Level 0	Environment
	K-Staff Female Toilet	1	Level 0	Environment
	K-Staff Male Toilet	1	Level 0	Environment
	lobbycounter	1	Level 1	Blk04
	lobbycounter 1	1	Level 0	Environment
	lobbycounter 2	3	Level 0	Environment
	lobbycounter 3	2	Level 0	Environment
	lobbycounter 4	1	Level 1	Environment
	lobbycounter 5	2	Level 0	Environment
	mailbox	3	Level 1	Blk04
	mailbox 1	1	Level 0	Environment
	mailbox 2	4	Level 0	Environment
	mailbox 3	6	Level 0	Environment
	recycle	1	Level 1	Environment

Quality:
All the /structure,architecture, building services are well coorperated,
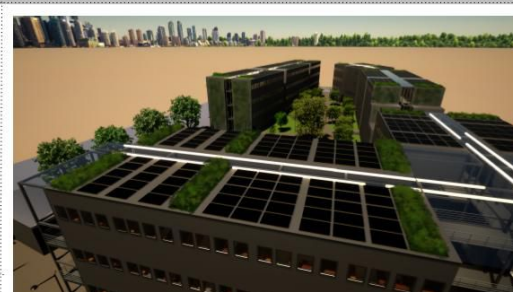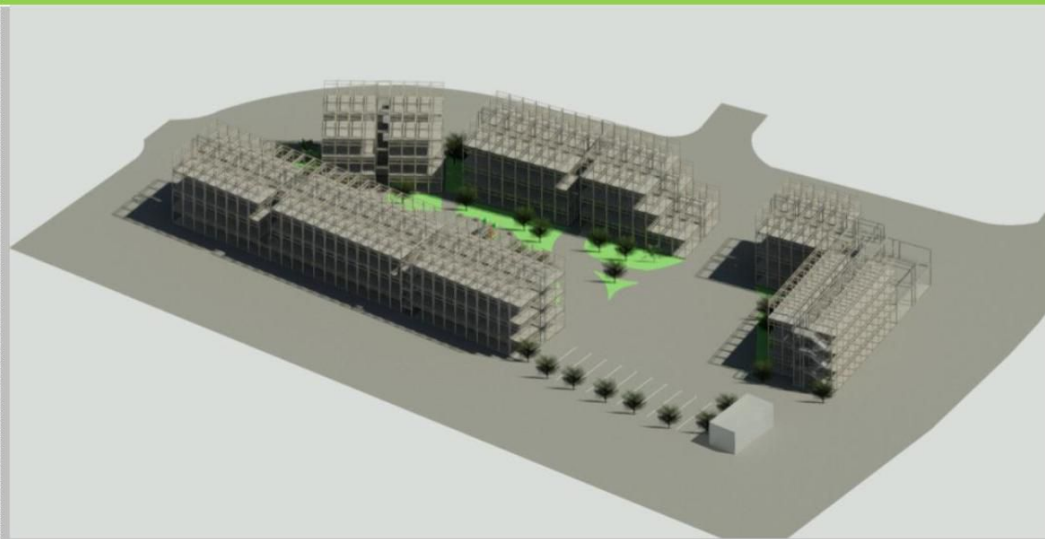

Sustainability:
There are solar panels on the rooftop of the buildings to supply electricity to the units. The convective windows allow plenty of ventilation and natural sunlight through units. Vertical Planting was also added in the updated design for effective cooling.
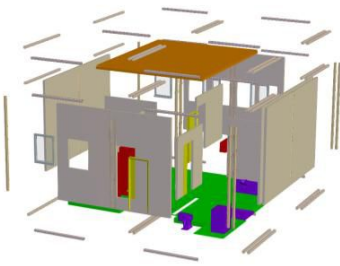
Perspective View:
There are four main blocks, each has a individual structural structure with slabs and columns, and also corridors and stairs.

MiC/DfMA: MiC units are adopted for all the residential units to speed up the construction duration. Since there are four major types of units, DfMA facilitates the assembly of the units. They can be transported to the site and installed efficiently.
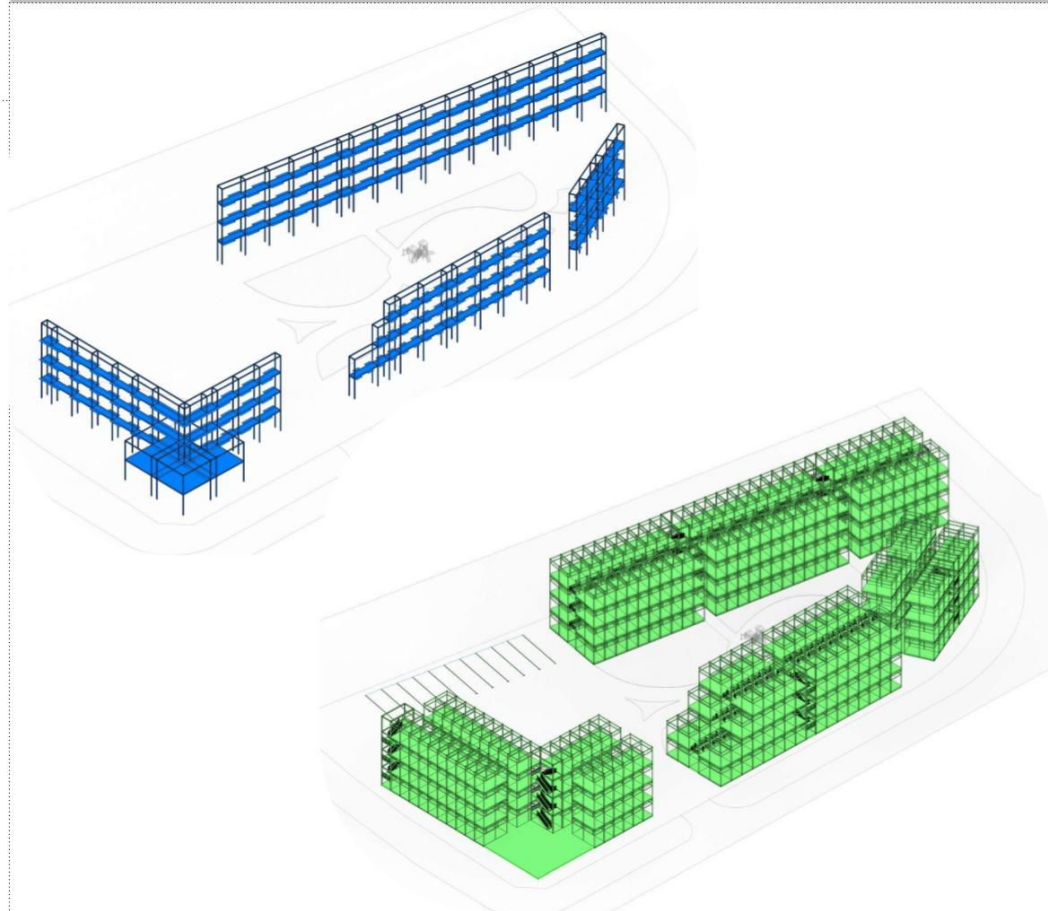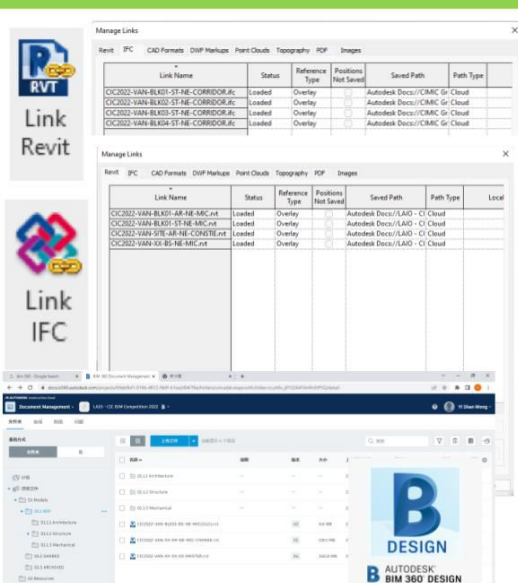

Internal Perspective 1:500
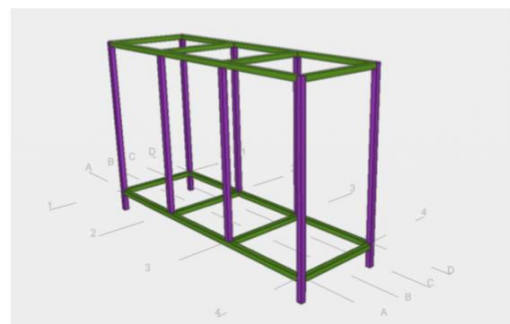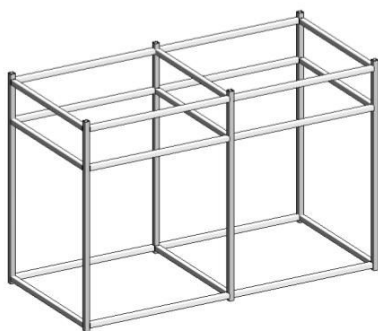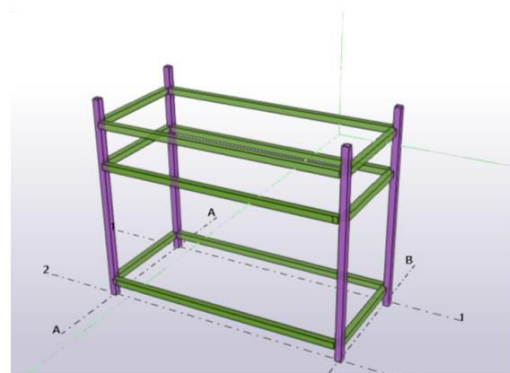
Computational Design : Different structural design are considered for the MiCs units. The final design is chosen as it has a higher loading capacity and it can be easily manufactured.

Sectional Perspective 1:500

CIC BIM Competition 2022
Modularity & Adaptability in Transitional
Housing Design with Use of BIM

Design Coordination: All files are linked to the master file with the function "Link Revit" or "Link IFC".
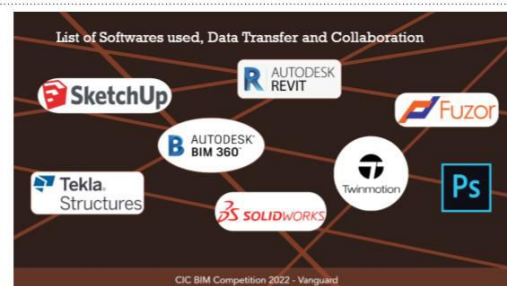
Project Team Collaboration: BIM 360 is used to store all the files and collaborate with one another. SketchUp was used for the brief interior design of the units. Tekla Structure was used for the structure drawings. Solidworks was used to design the connector. For the MiCs units, Revit was used for the architectural and structural design, and MEP drawings.
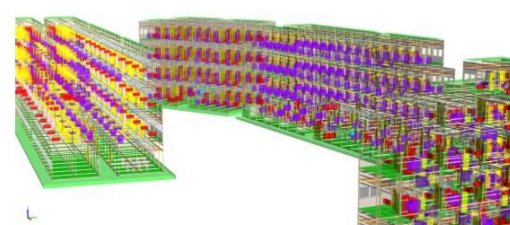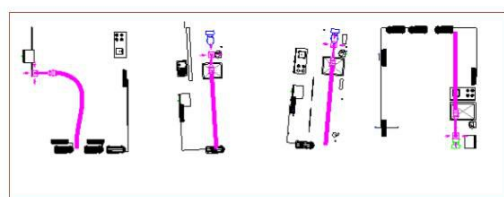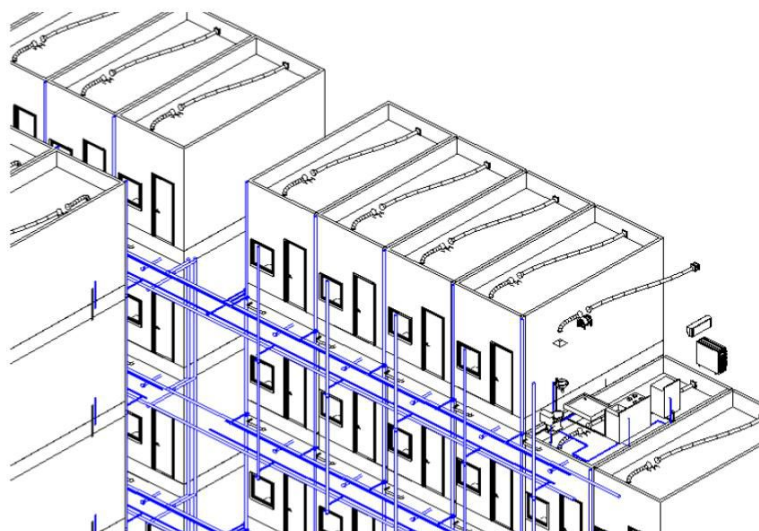

Computational Design : By taking different perspective and section views from Revit, all the pipes does not intersect with each other
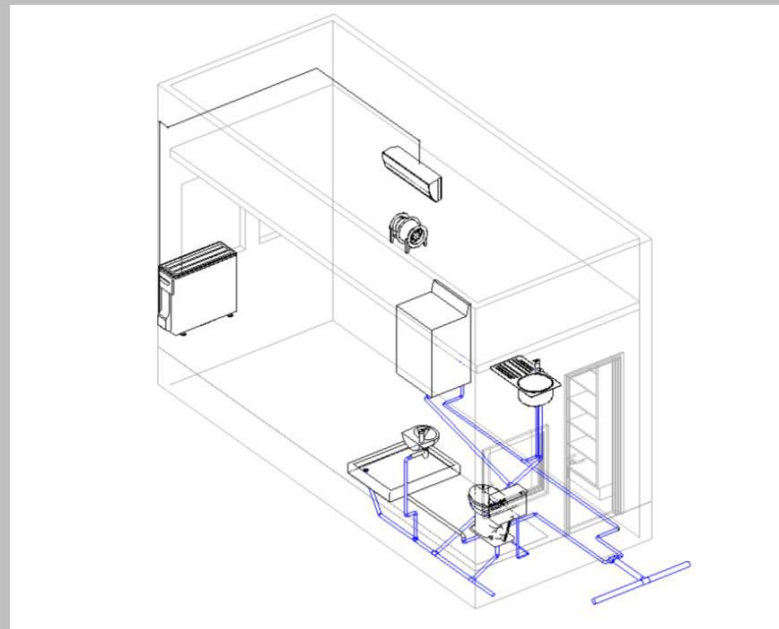
Perspective View:
Each units contains plumbing, HVAC system and electrical systems

Internal Perspective 1:500

Sectional Perspective 1:500

CIC BIM Competition 2022
Modularity & Adaptability in Transitional Housing Design with Use of BIM
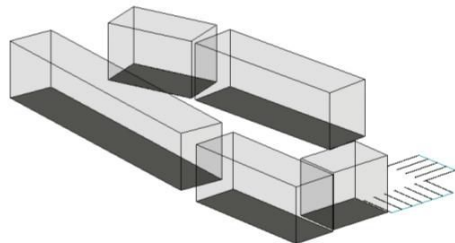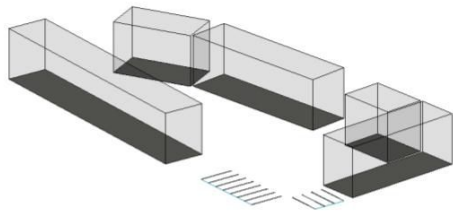
CIC BIM Competition 2022 – Submission Poster Template
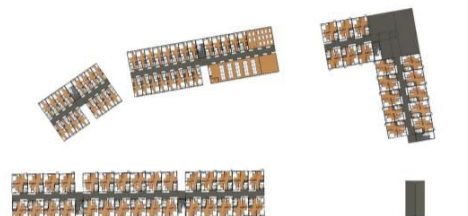
Site Layout Plan 1:1000

Perspective View:
surrounding the centre garden, units are systematically arranged together. Multiple entries, shops and garden attract people from outside,
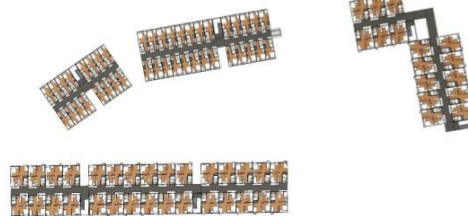
Ground Floor Plan

First Floor Plan

Second Floor Plan
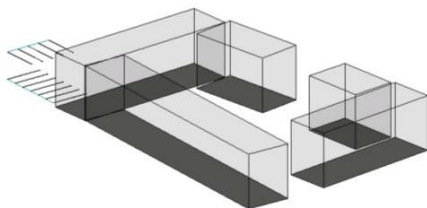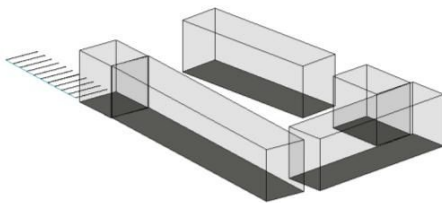
Third Floor Plan

Computational Design: Several land planning models were made in Revit. The first one is chosen to be our final design since it maximises the central garden area and provide a wide visual space
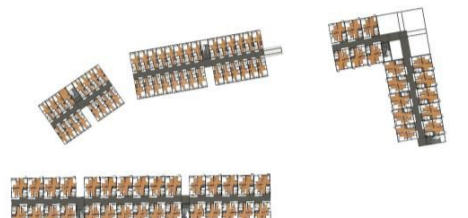
1 person unit

Internal Perspective 1:500
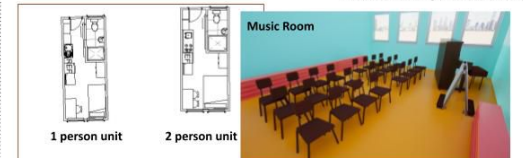
1 person unit   2 person unit   **Music Room**

3 person unit   5 person   **Gaming Room**

Classroom

Kindergarten Internal Perspectives
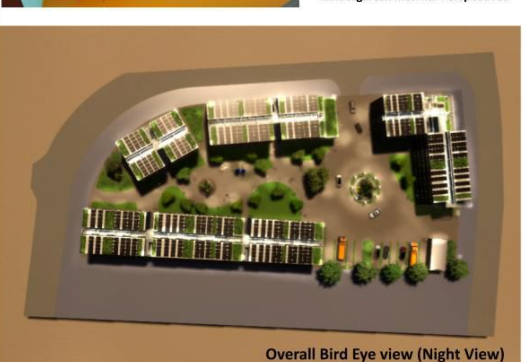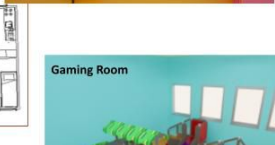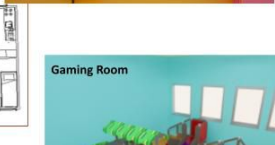
Overall Bird Eye view (Night View)

CIC BIM Competition 2022
Modularity & Adaptability in Transitional Housing Design with Use of BIM