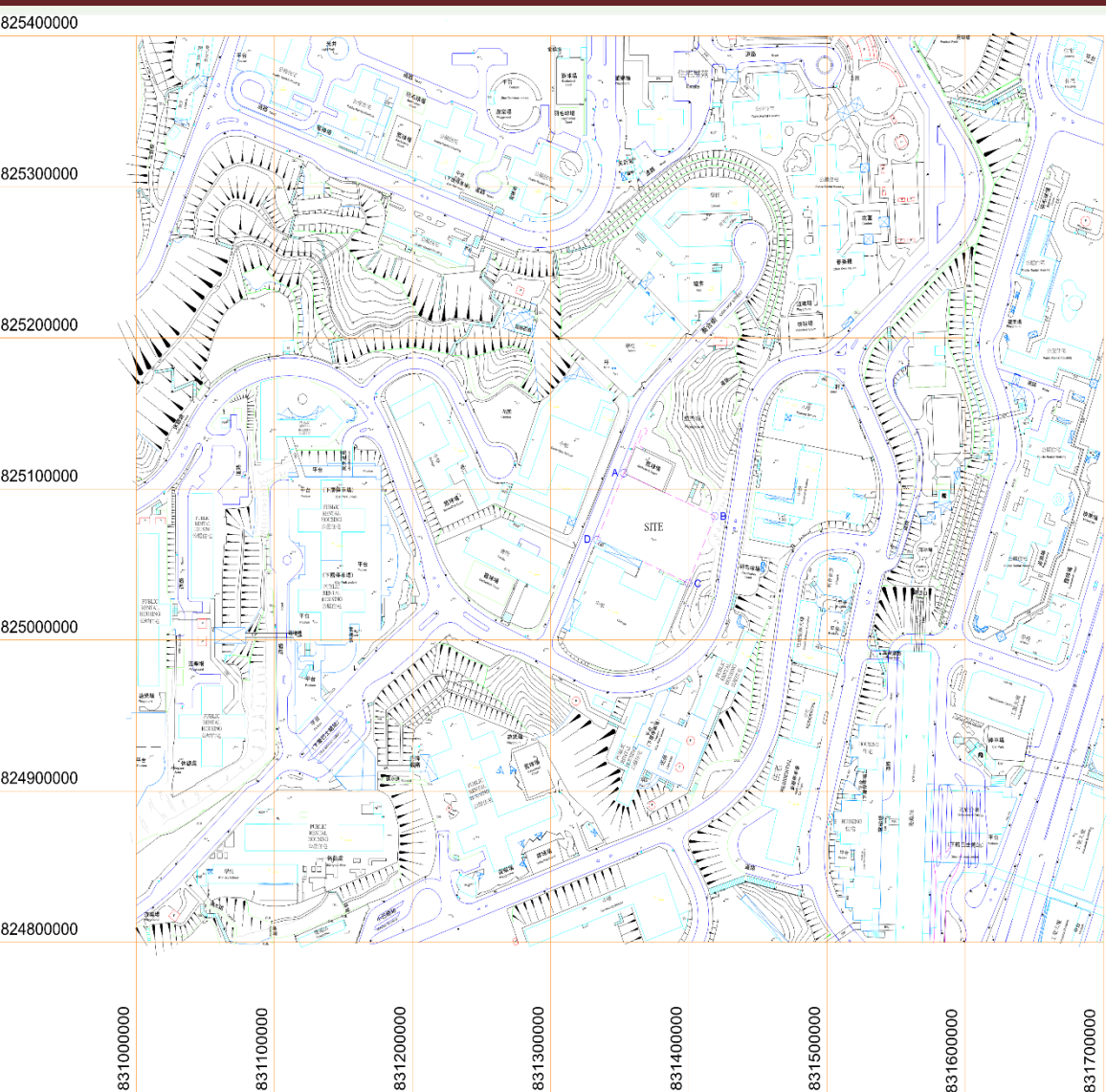


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About the New Development of the Student Hostel

Design Concept:

There was a time an architecture student might simply walking through the campus without recycling bins, green space and sustainable features and not realize how building sustainability might grow in importance, hence rarely considering how to implement such evolutionary concept in the design, construction and other lifecycle phases. The quintessential adage, "When one drinks water, one must not forget where it originates", constantly reminding us of those who and what that make the present possible for us. The creativity, speciality, diversity and versatility in the hardware and software are based on the integrated natural and built environment where we have been raised and nurtured. Our building, which is the nest for fledglings to learn from our respectable flyers.

Building Form:

Adapted from the HKCIC significantly representative cubic logo, we implement the "C", "I" and "C" in our building envelop to From our site visit, the panoramic city view full of a profile of conspicuous highs and lows, traces of historical times and civilization progression and inheritance enshrined from the industrial and aged residential buildings, and the human touch and benevolence from the nearby sport grounds, schools and other community facilities will be enjoyed by the occupants and users. Internally, they will sightsee and tour the G/F garden, the 1/F verandahs with sitting areas and the R/F garden with a high degree of solarization are situated with the pleasure to connect with the green environment. At one end of the c-shaped canteen, 4 structurally supportive bars will prevent the extruded parts of upper floors from one-side-supported suspension.

Spatial Arrangement:

The dormitory areas will be situated from the 2/F to 9/F with sufficient provision of common areas, for example, pantries and lift areas. The G/F will be the main lobby with a concierge and The 1/F will be the canteen with open areas at 2 ends of the C-shaped area. The R/F garden, which adopts a high-class but stress-less design, will be accessible to occupants for leisure.

Connectivity:

Apart from the basic provision of scissor stairs for fire evacuation located in the central area of the building and the elevators, the major internal connectivity feature will include the uniquely designed bridge with red steel bars of irregular polygons which differs greatly from other bridges. Externally, the carport will be provided catering for vehicles maximum of a truck's height near the main entrance for students, staff and guests.

BIM Uses in Design, Collaboration, Engineering, Analysis and Optimisation:

BIM technologies are used throughout the design cycle.
Revit 2019: Design and rendering
Naviswork (with Microsoft Project): Scheduling and 4D Construction Optimization
BIM360: Design Collaboration
Enscape: 3D Rendering and walkthrough
Vray: 2D Rendering
Insight: Solar analysis

BIM Collaboration approach:

BIM 360 is used for centralized documentation of files on cloud platform. It allows version control and comparison by which we are able to visually understand what changes are made to the earlier version of design by other teammates. More importantly, with BIM360, we can point out, circle and highlight changes that are undesirable, subject to modification or yet to be done on BIM360 platform.
Naviswork is utilized for clash detection. It improve coordination among architectural model, MEP model and structural model. It also enhances ability to filter through building elements quickly and runs collision tests between isolated building elements in the architectural model.

Quality of Design:

At the initial design stage, Revit 2019 allows for instant visualization of design outcome. We can receive feedback from the rendered image and immediately make adjustment to the choice of materials and finishes. BIM360 foster design collaboration and the quality of design can be improved through easy data transfer and idea exchange on cloud platform. During design stage, the optimization of design is achieved through the use of various software and plug-in. For example, Insight is used for solar analysis and heat absorption analysis. It allows us to design more an energy-efficient building with advanced simulation engines and building performance analysis.

Sustainability:

Curved Sunshades to Balconies & Curtain Wall on the South & West Elevation are provided to minimize the absorption of solar energy during daytime. While maximizing the amount of natural daylight that can be enjoyed by residents by the use of curtain wall, blue-tinted low-E glass is used in curtain wall to reduce heat absorption. The non-covered area and rooftop is designated as garden and green roof to mitigate heat island effect. Solar panel on upper roof provides alternative renewable energy sources to the building as well.

MiC/ DfMA:

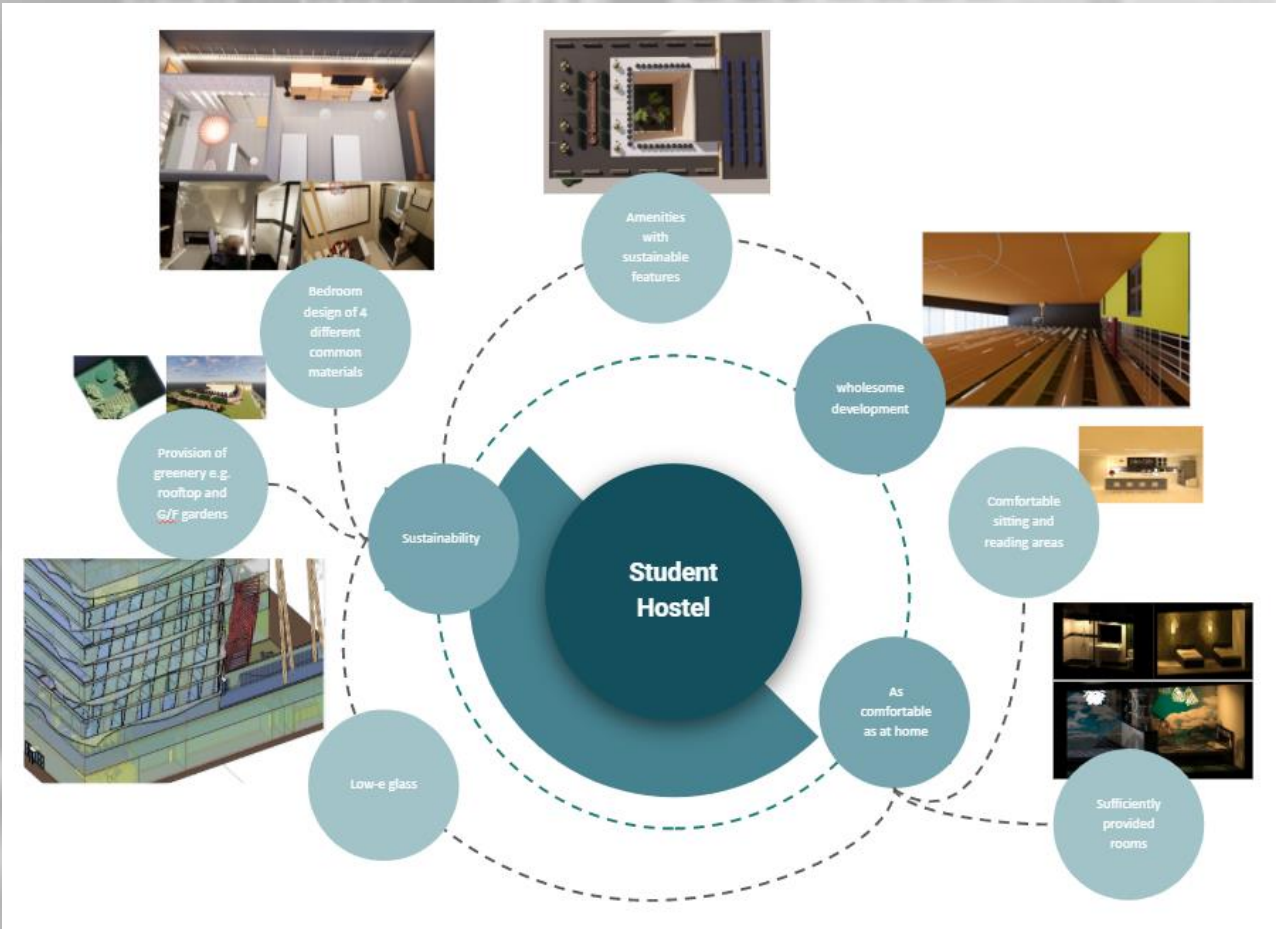
Single Student Room, Guest Room, Accessible Guest Room are modular units prefabricated in the factory. Staircase and external curtain wall are precast as well.

Constructability:

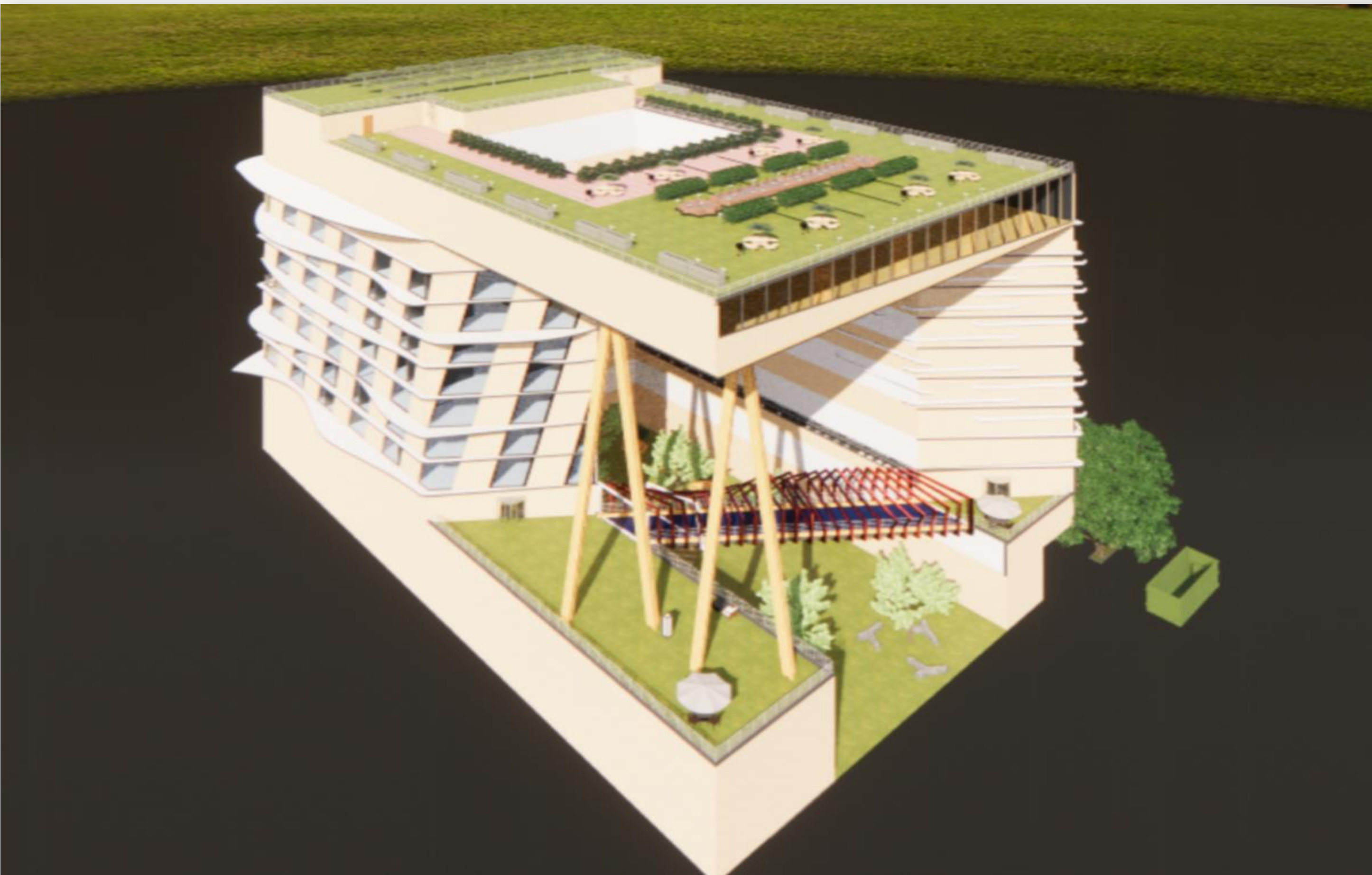
Several building elements in the architectural model is designed as pre-fabricated modules which can be pre-fabricated in the factory, transported to the site and easily installed on-site, including pre-cast concrete floor slab and partition wall. The overall constructability of our design can hence be improved by the use of MIC and pre-fabricated elements.

Summary:

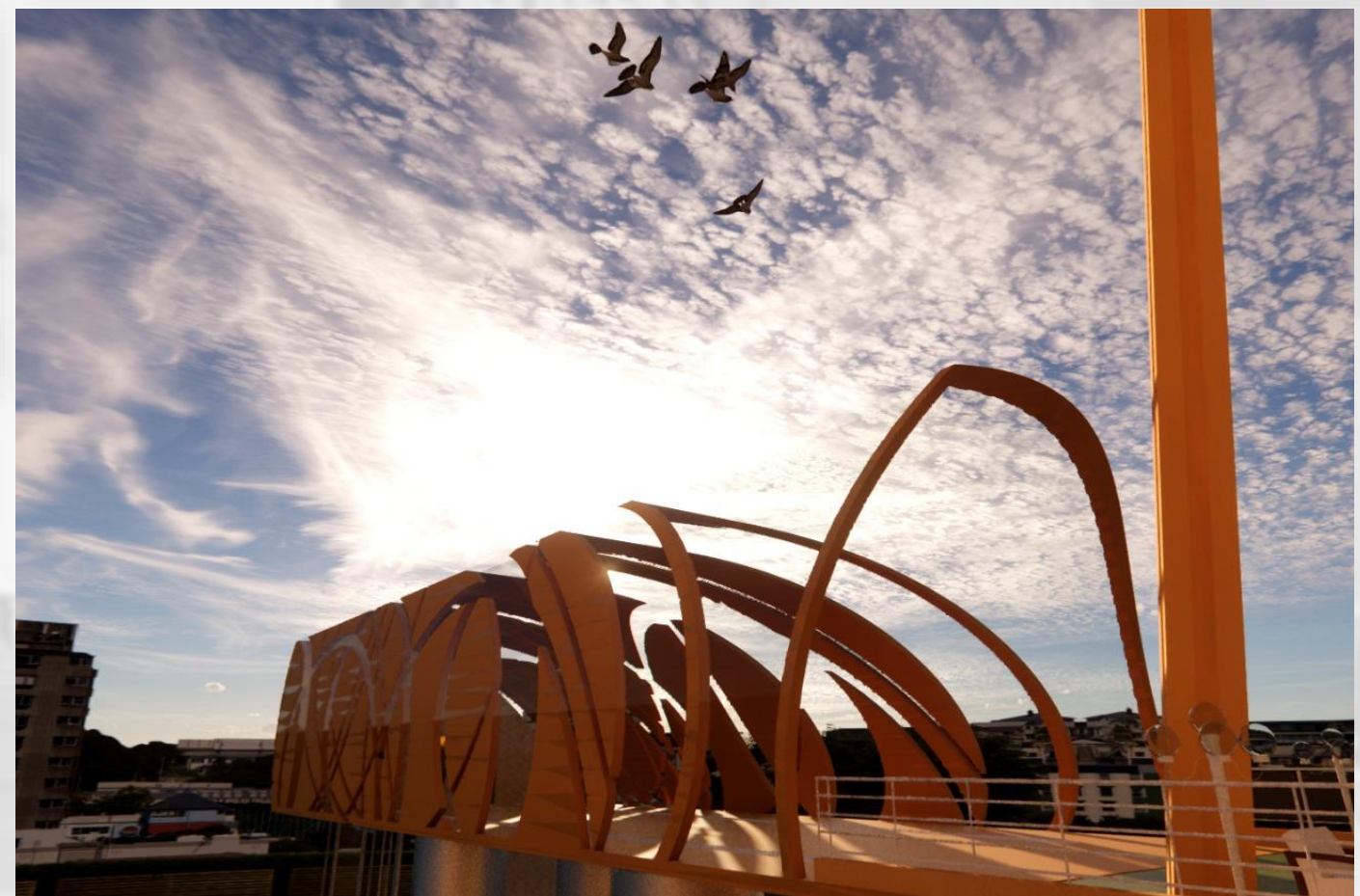
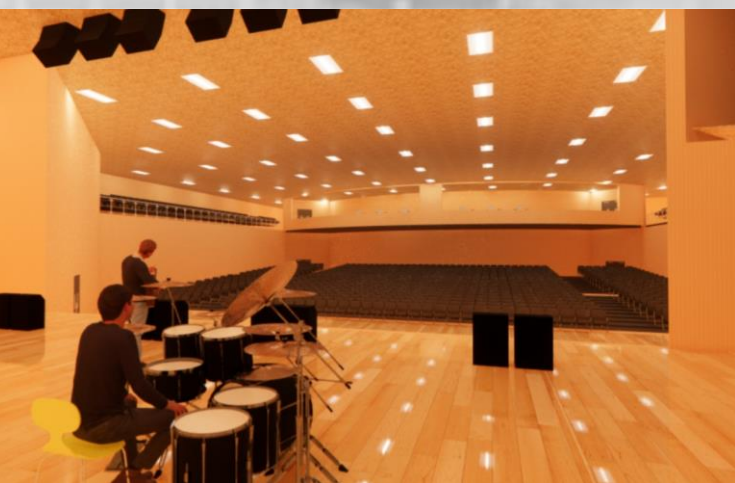
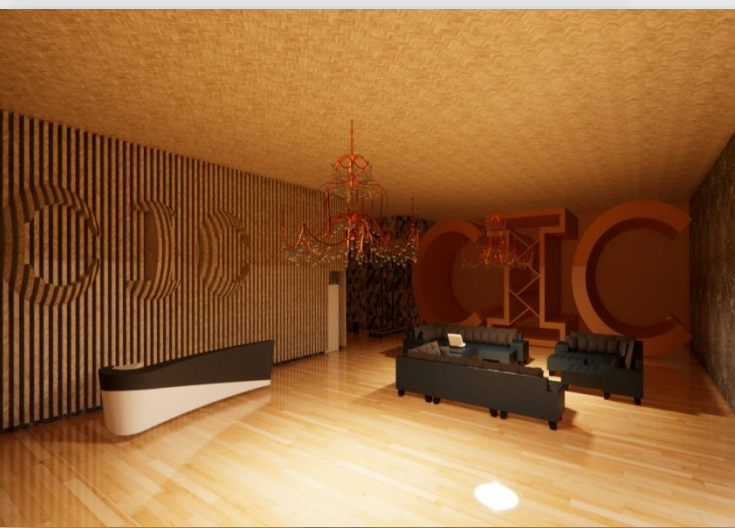
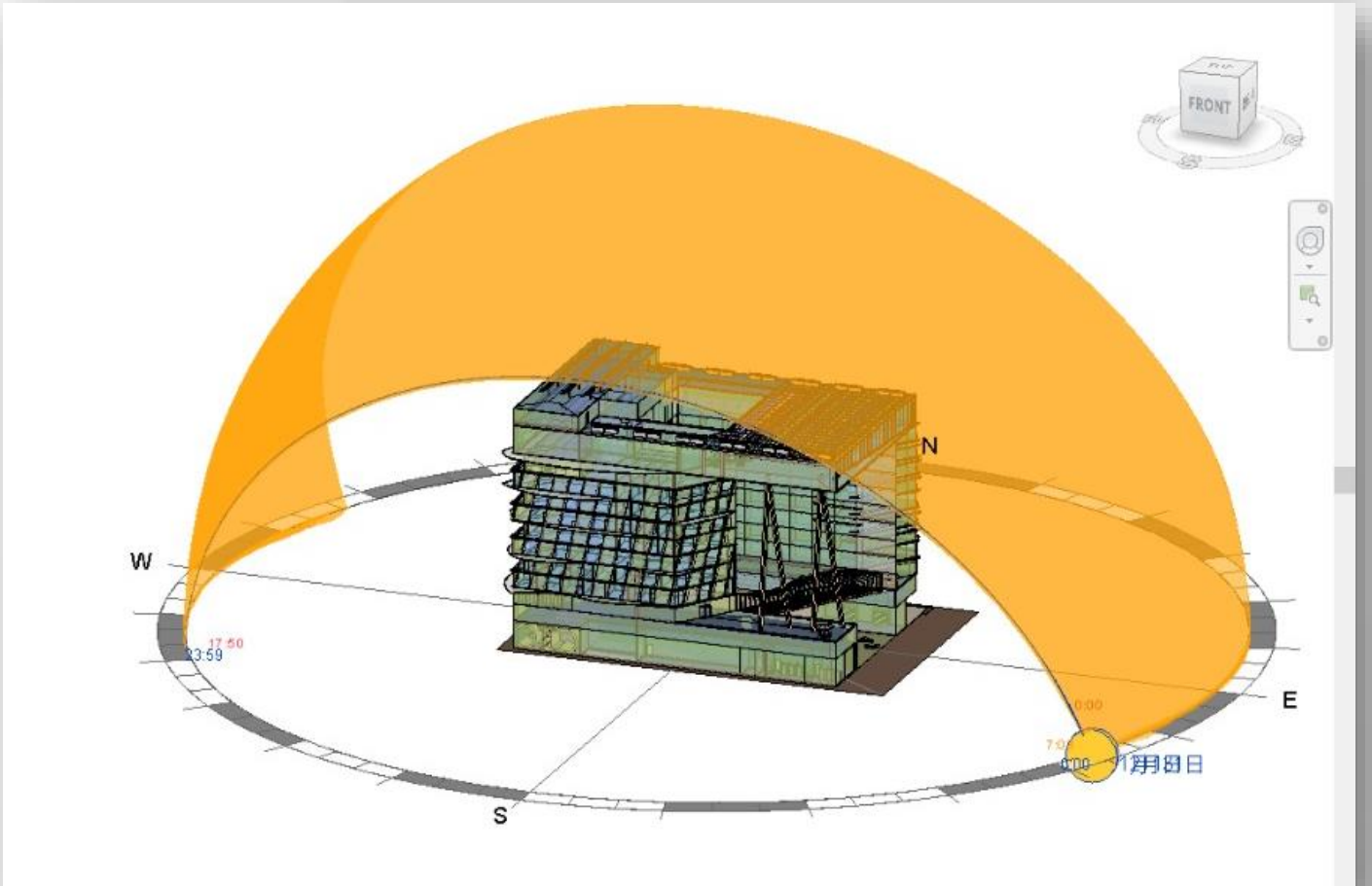
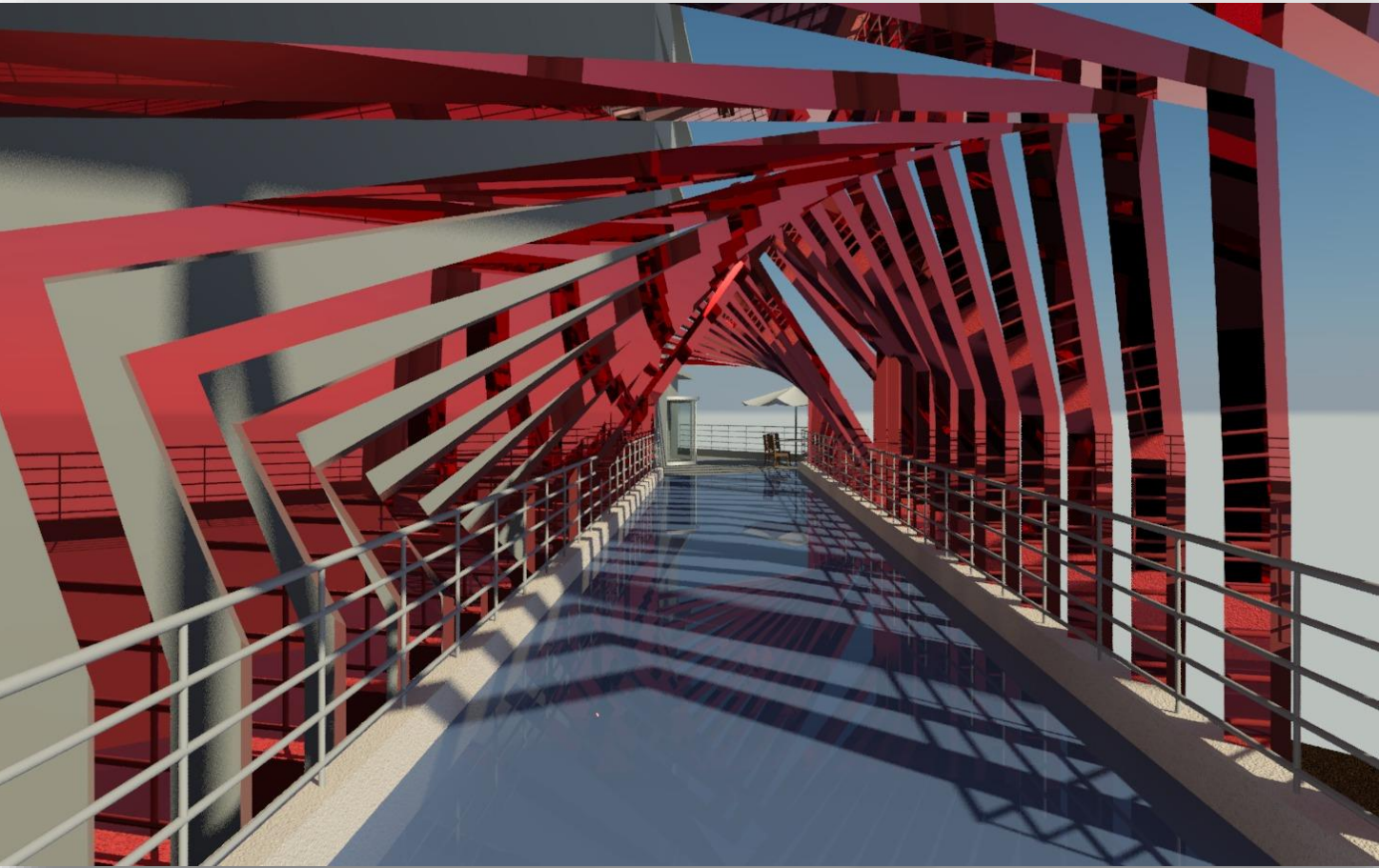
BIM provides an integration medium of a less complicated means for detailed and accurate design procurement, tremendously supportive plugins and peripherals and time-saving automation techniques so that the design has been optimized and spectacularly integrated.



Conceptual Diagram: The mind map we create our major scopes of works after the identification of what architecture students need.



Overall Bird Eye view: The site is located in Kwai Chung and surrounded by Government, Institution and Community Facilities. The rear side of the building is behind a slope, enjoying the view of cityscape of Kwai Hing and Kwai Fong. The non-roofed area is henced designed as open space and landscape area where residents can carrying out leisure activities and the building can better be incorporated into the natural environment.

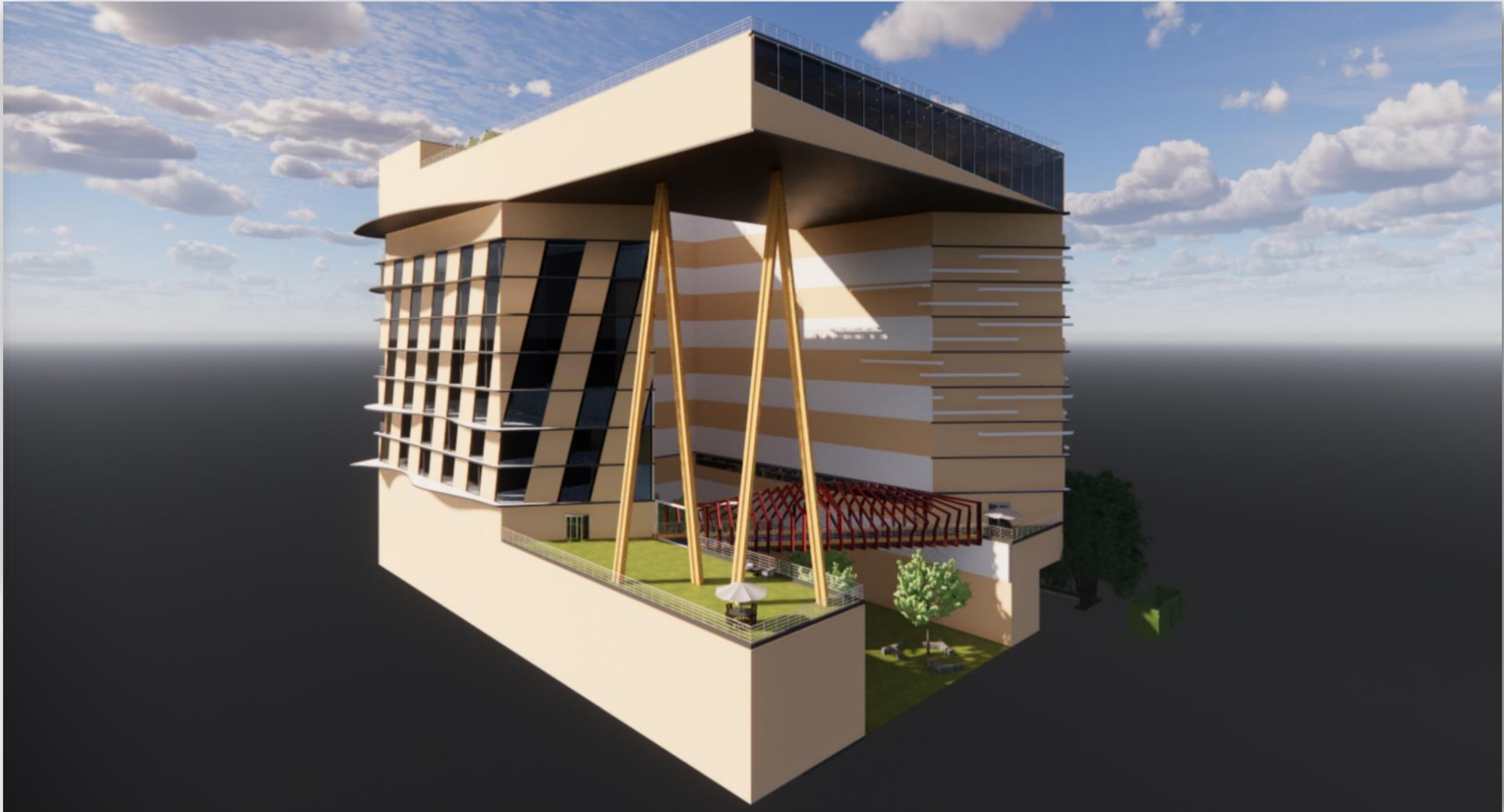
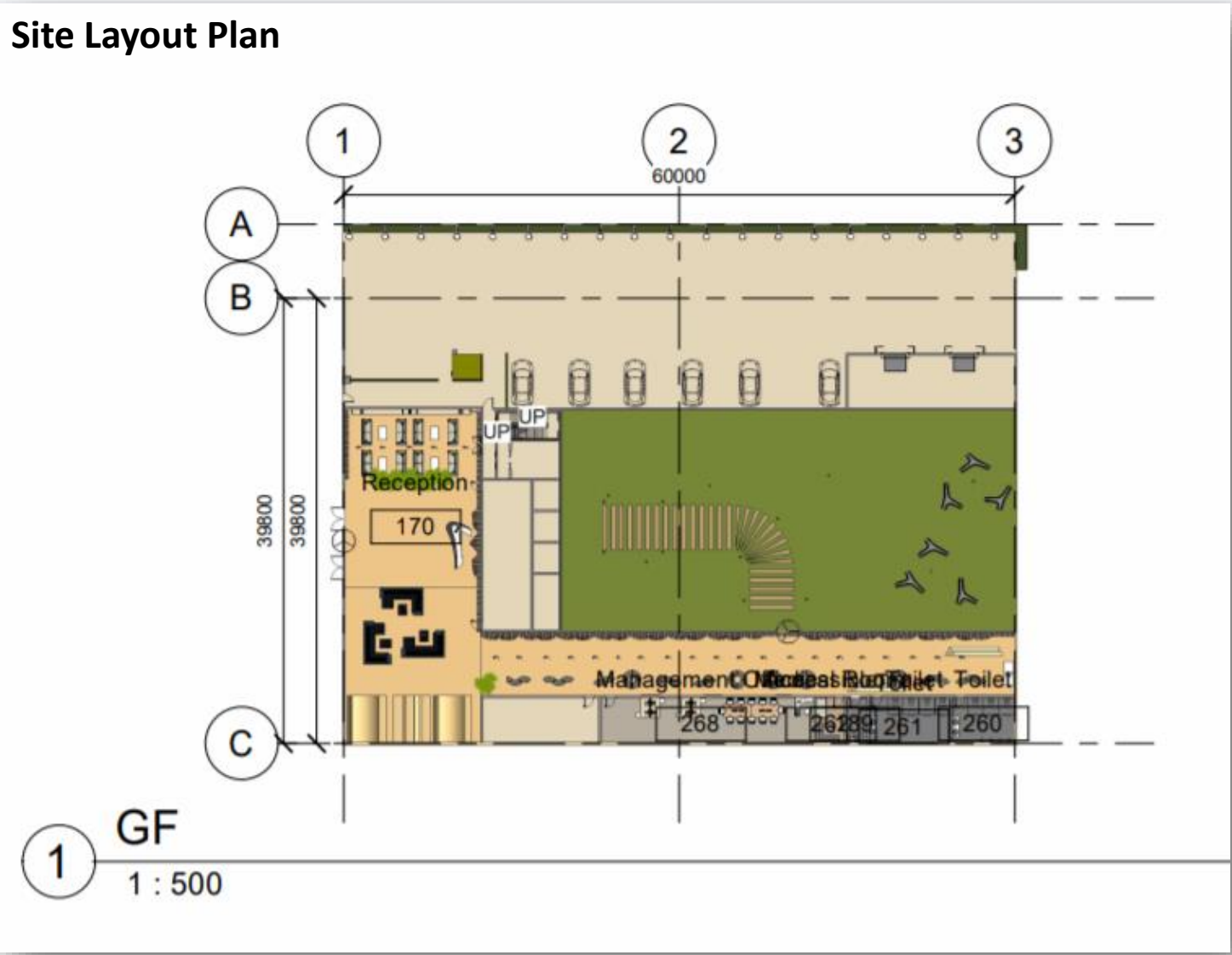


Pedestrian Facility connecting the Kwai Shing Circuit

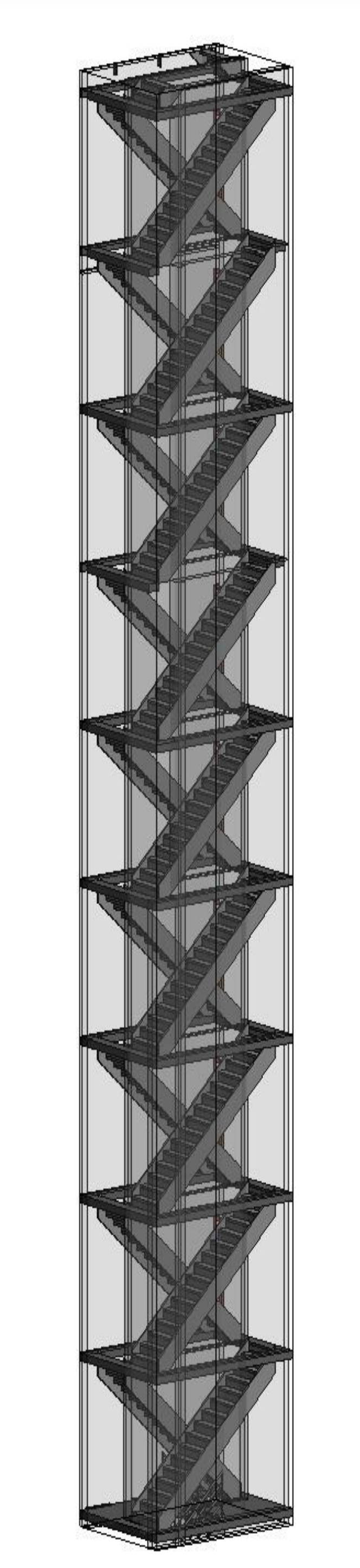
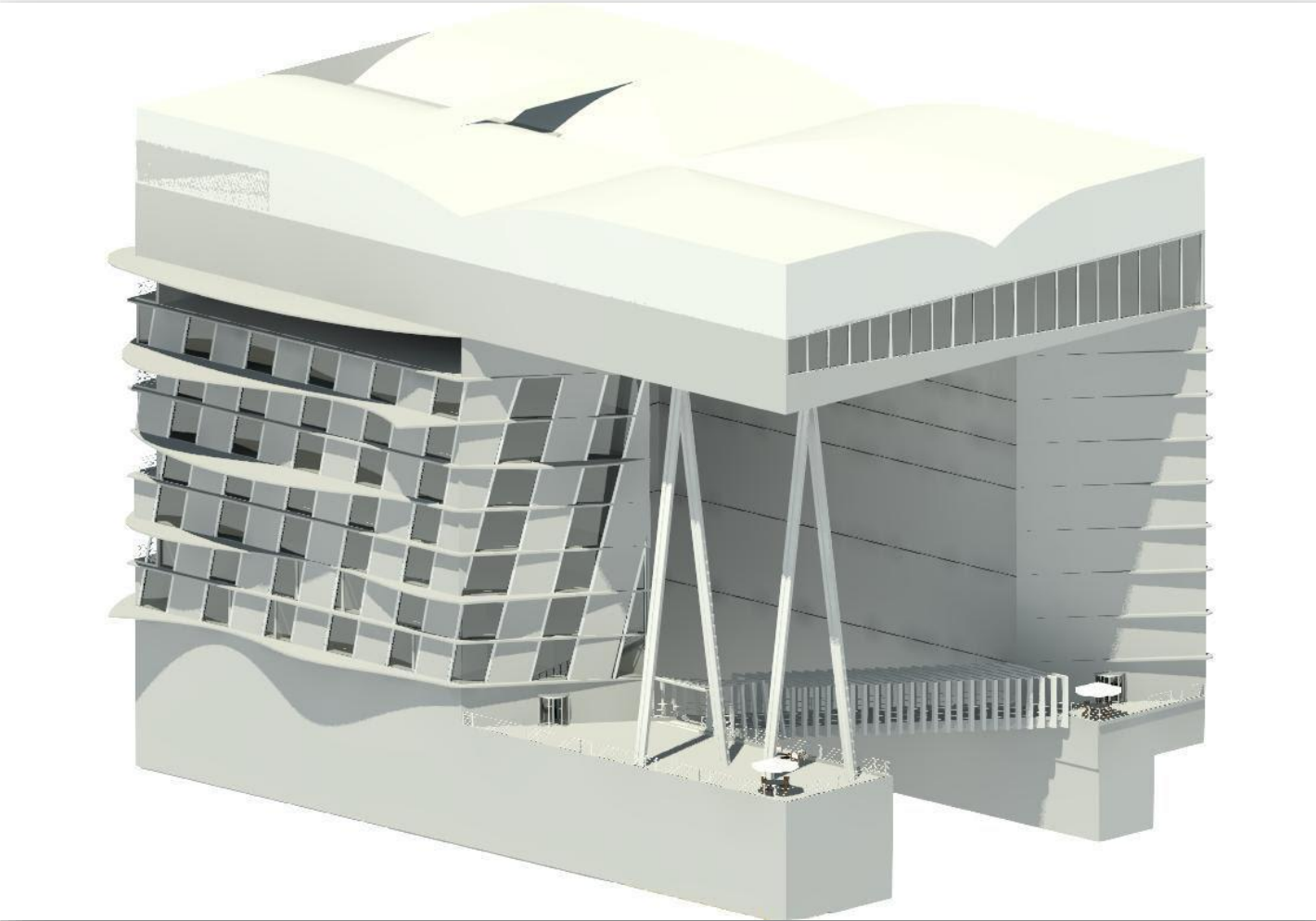
Quality: Revit 2019 allows for instant visualization of design outcome. BIM360 foster design collaboration and the quality of design can be improved through cloud-based idea exchange. Insight is used for heat absorption analysis so an energy-efficient building can be built.

Sustainability: Curved Sunshades are provided to minimize the absorption of solar energy during daytime. Blue-tinted low-E glass is used in curtain wall to reduce heat absorption. Garden and green roof are provided to mitigate heat island effect. Solar panel on upper roof provides alternative renewable energy sources to the building as well.

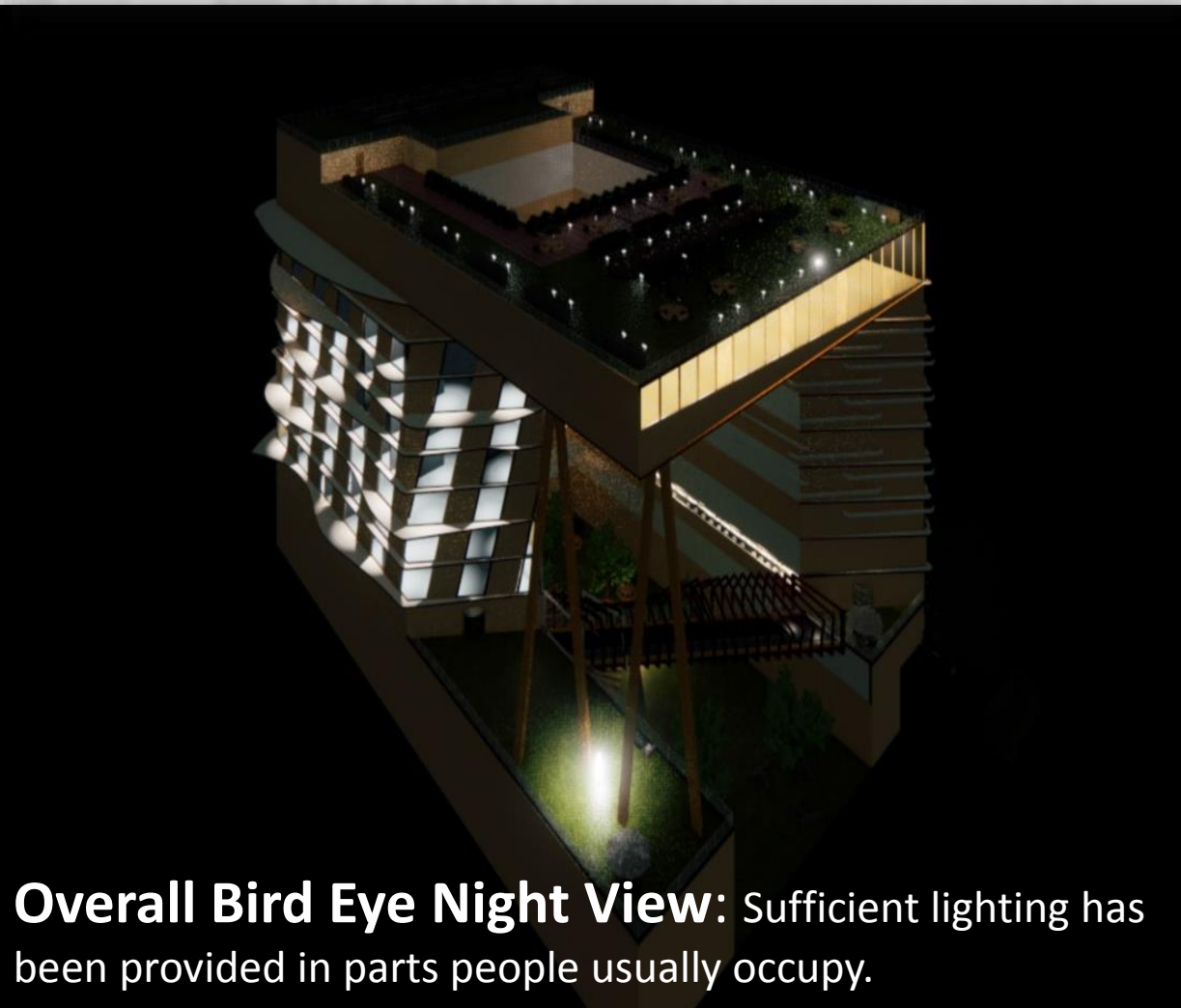
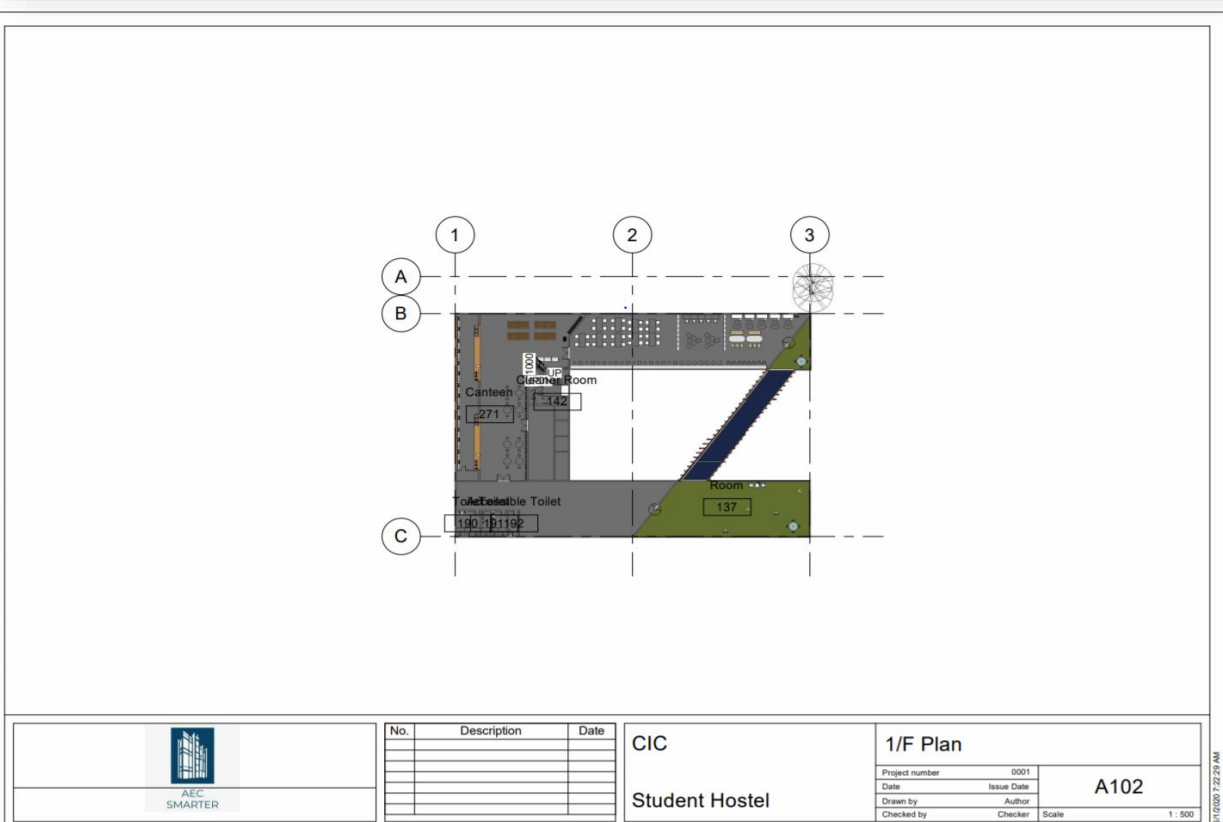
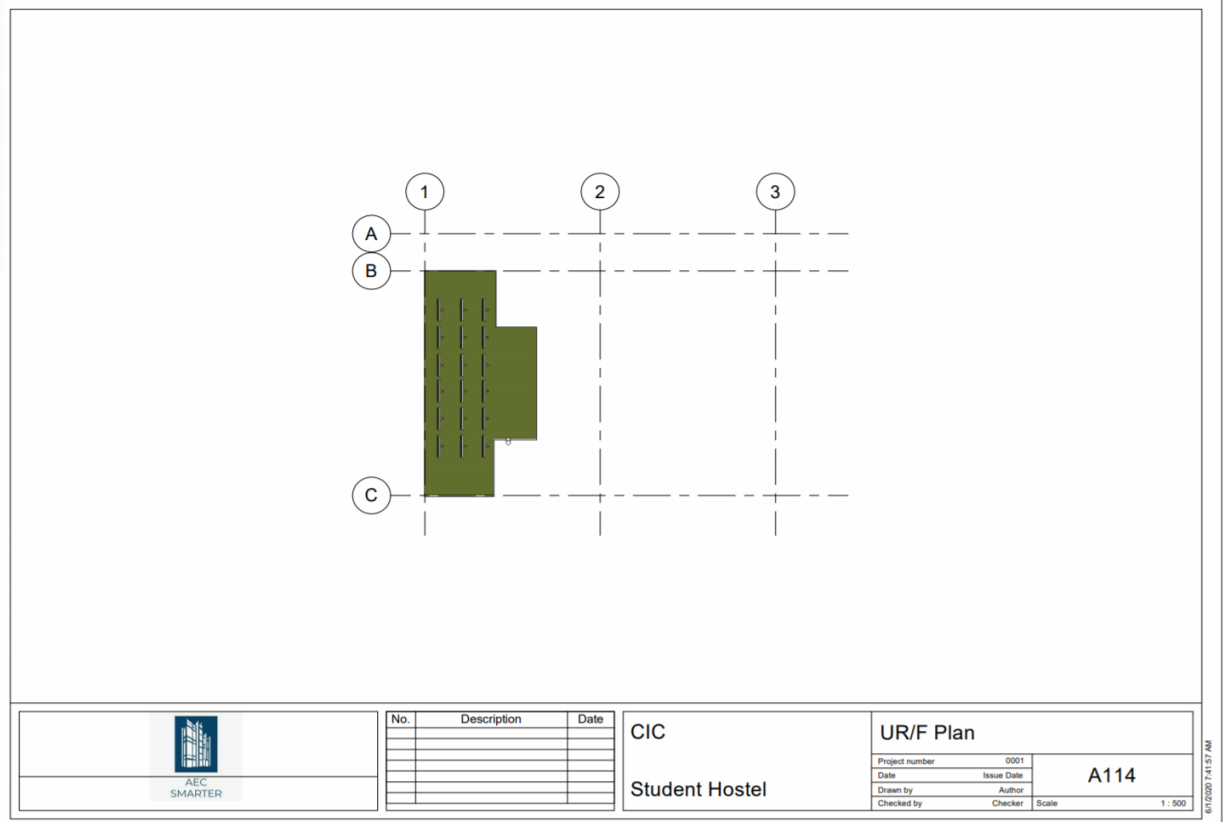
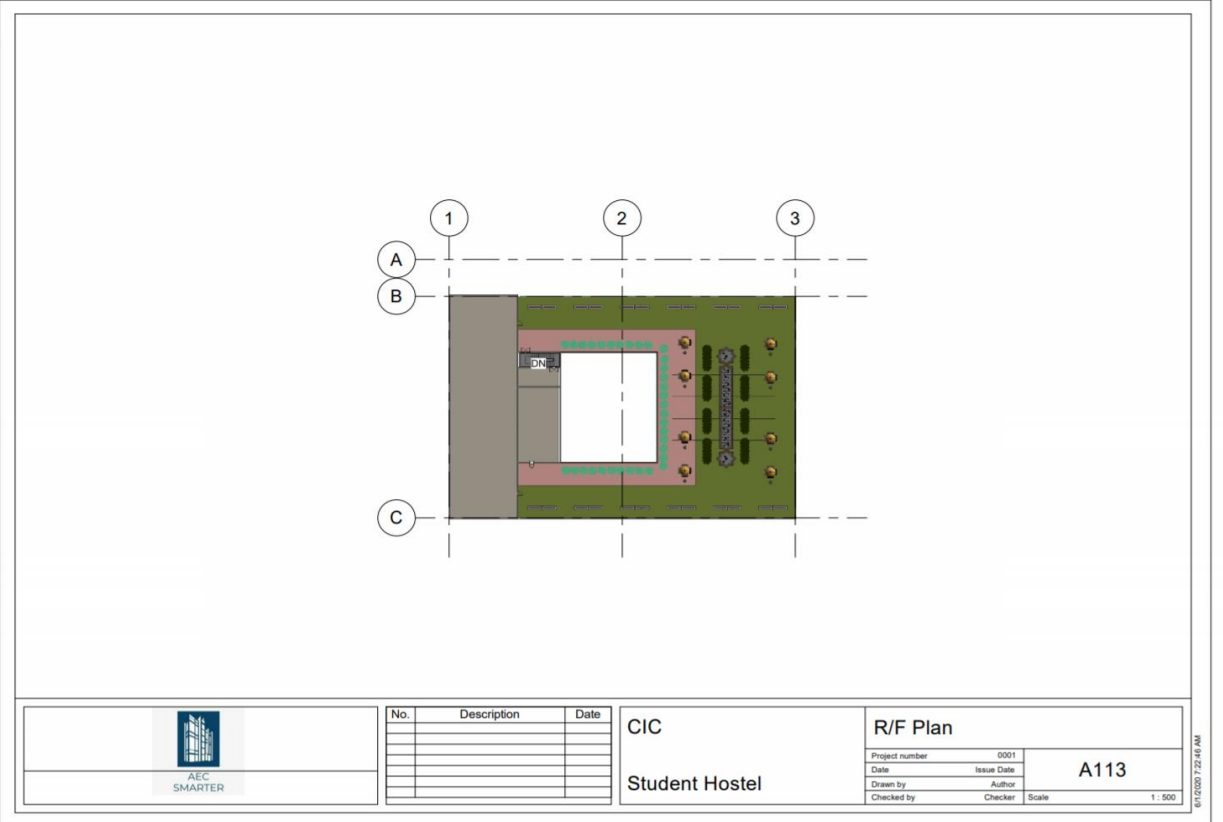
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Perspective View: During the design process, computation of area of rooms and spaces is completed through the use of Revit to ensure the spatial requirement is met. Rendering function that offers visible response to designers helps enhancing the appearance of our building, in terms of both interior and exterior.



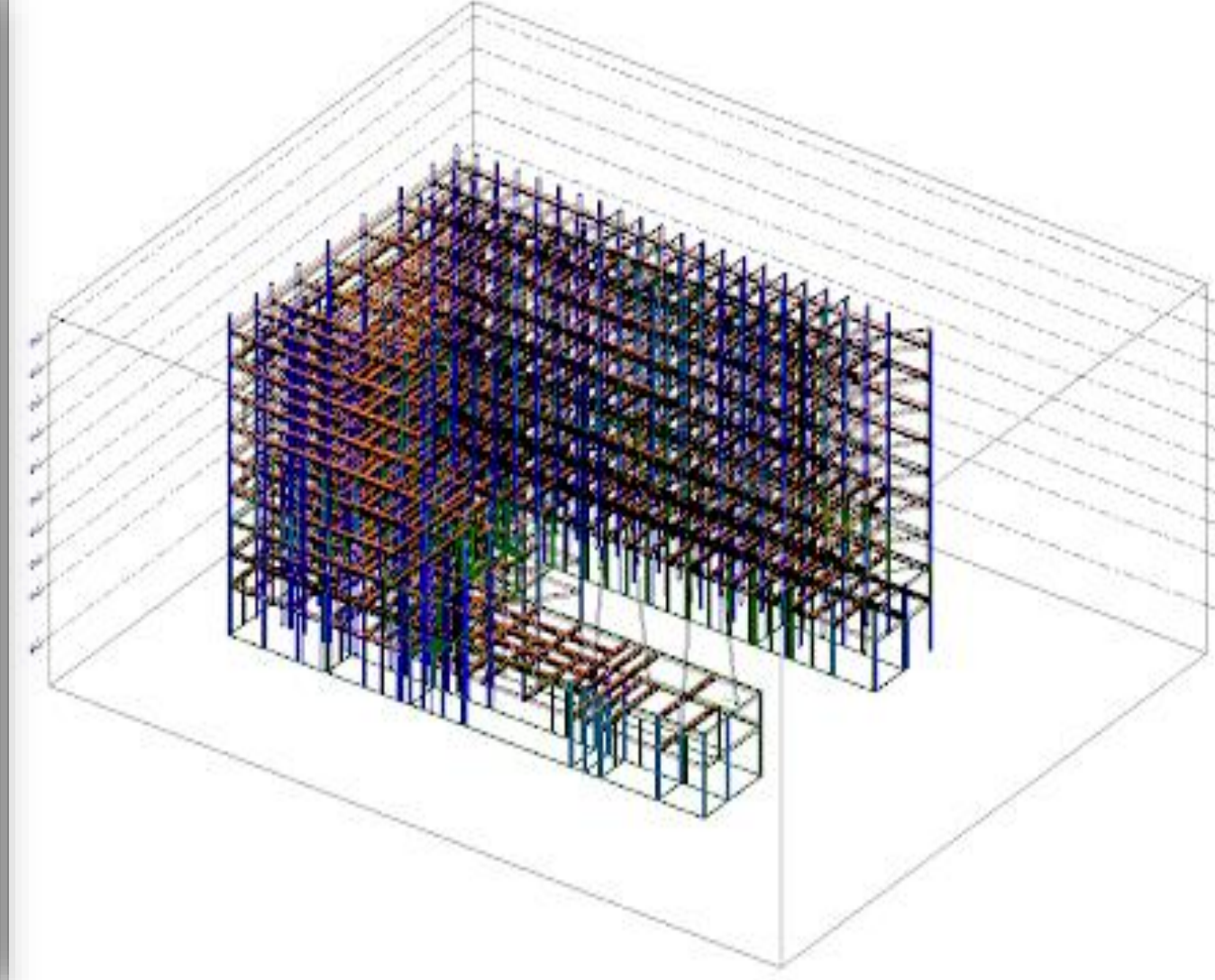
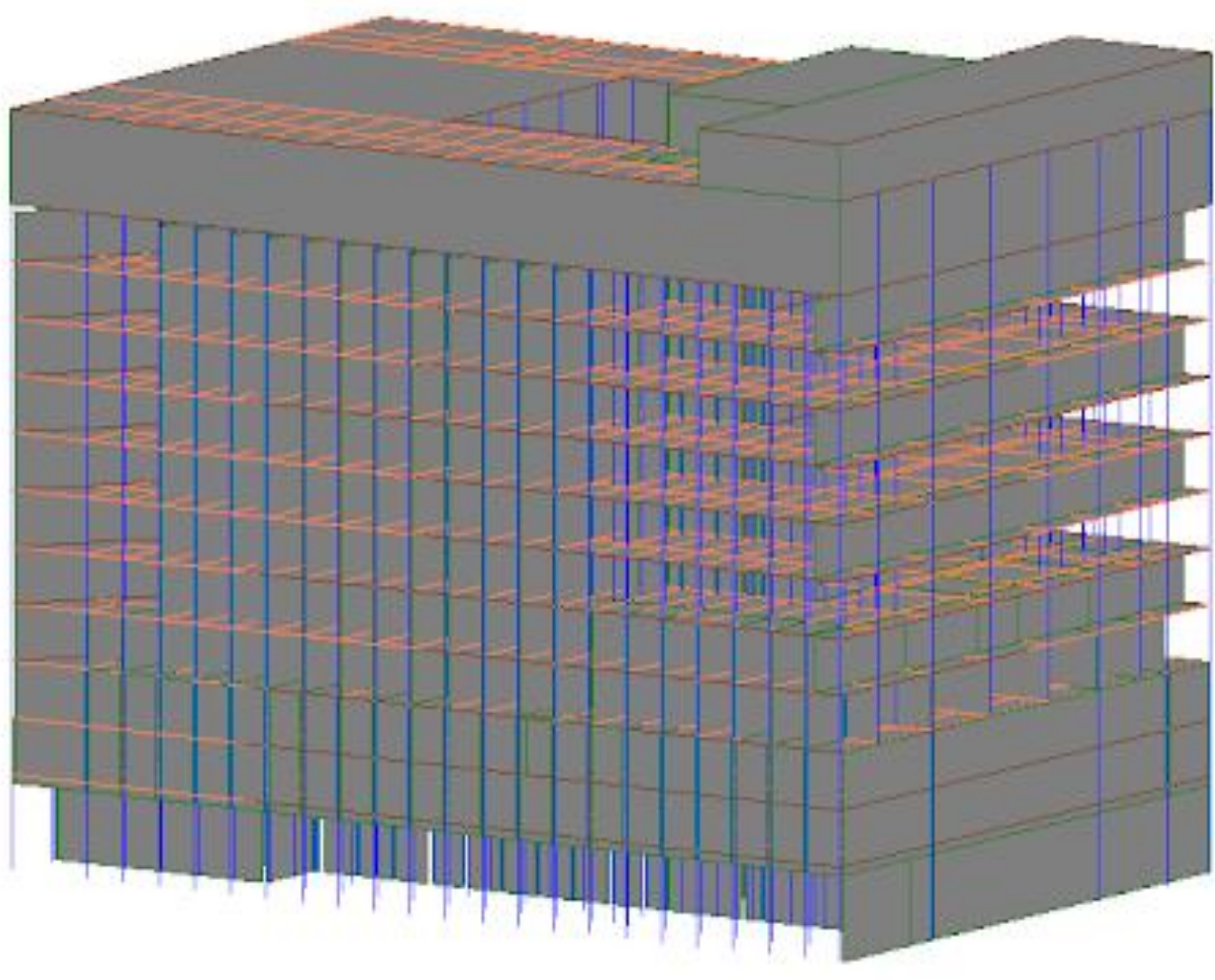
Internal Perspective: The BIM architectural enables the high-quality design allowing realistic modelling.



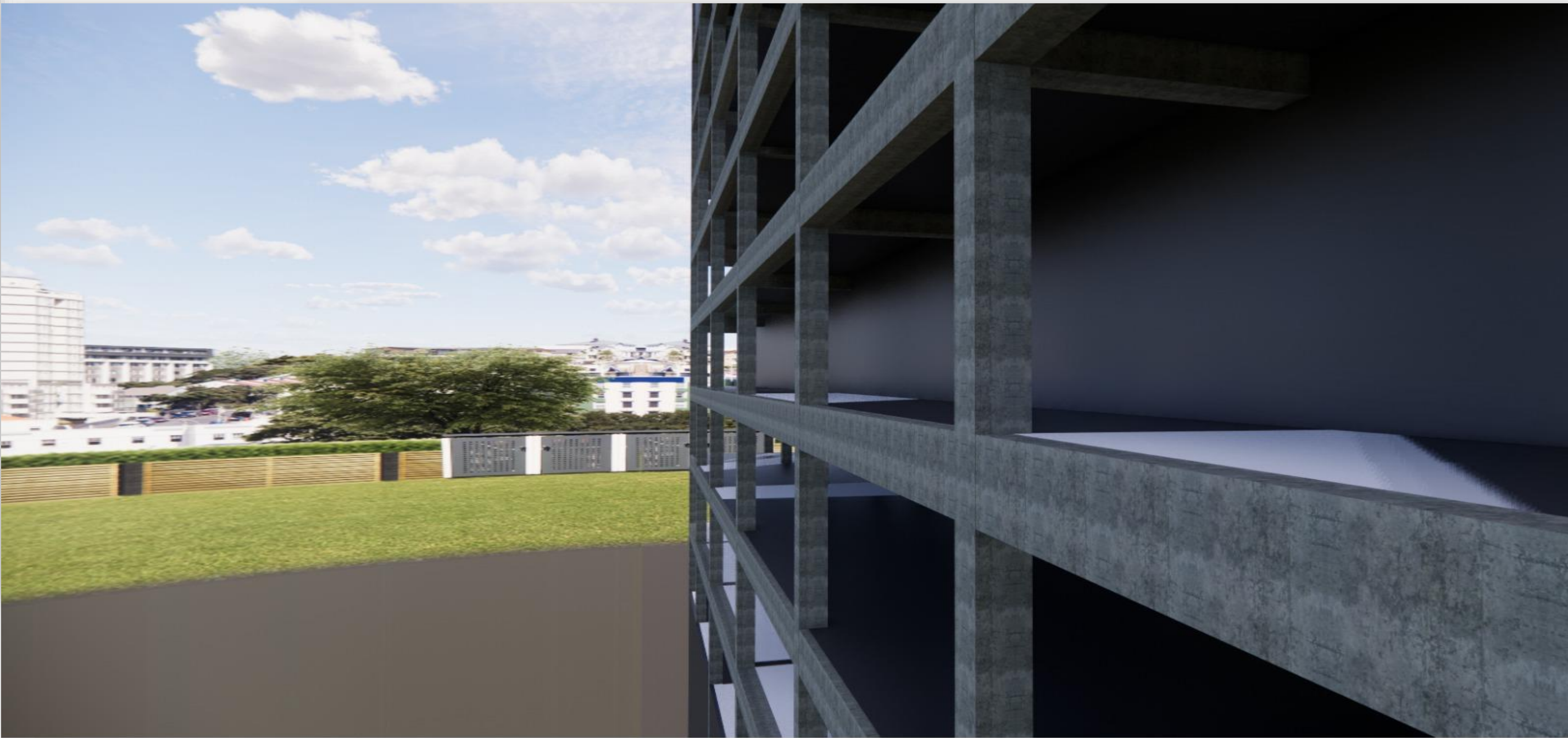
Overall Bird Eye Night View: Sufficient lighting has been provided in parts people usually occupy.

Computational Design: The computational design could be demonstrated through the modelling of the staircase and the building envelope.

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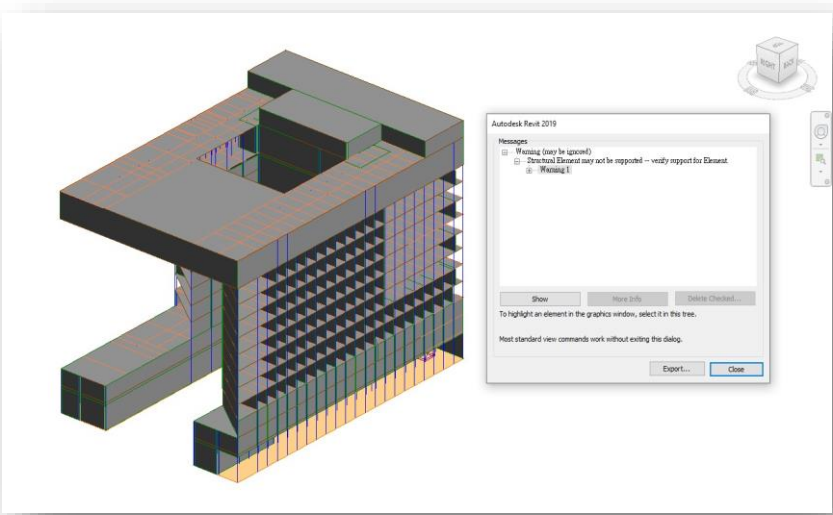
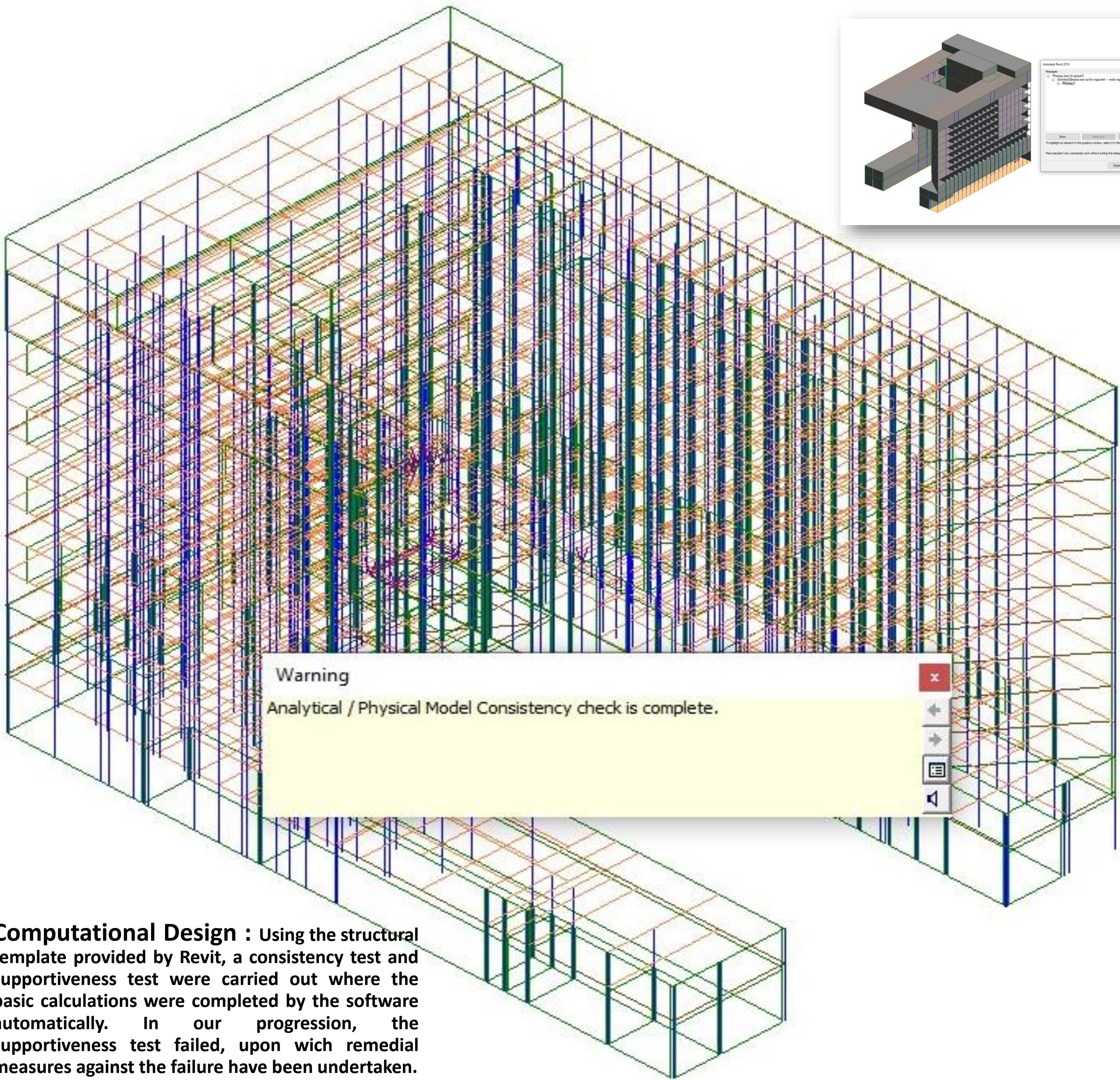


Perspective View: The structural design of our model is completed in Revit 2019. It is designed in accordance with Code of Practice for Dead and Imposed Loads 2011 and Code of Practice for Structural Use of Concrete 2013



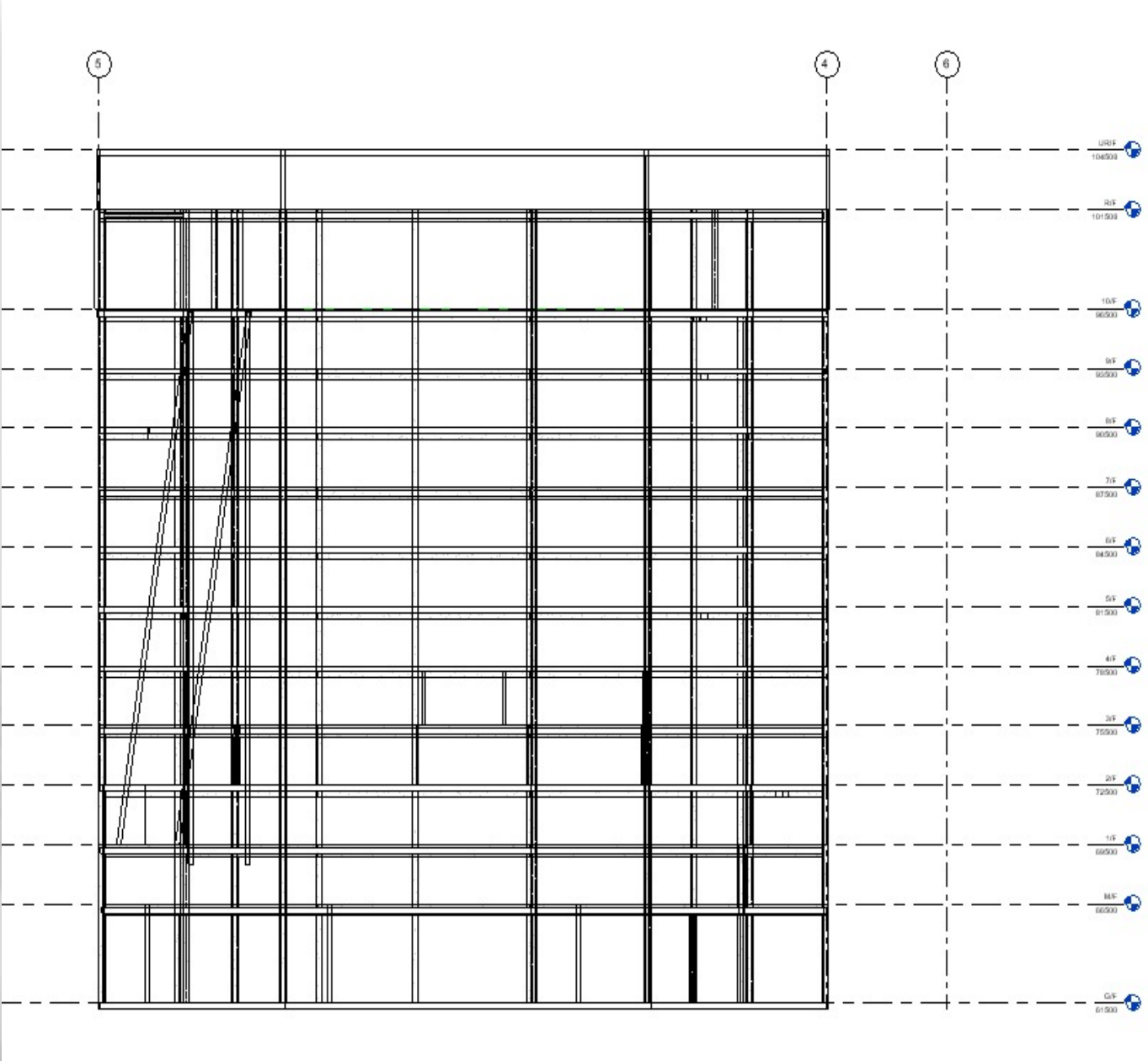
MiC/DfMA:
The hostel comprising mostly residential units sharing similar patterns. The student rooms will be respectively prefabricated and integrated on-site using special jointing and bolting technologies whereas the other uniques parts, for example, the canteen, the sports hall and the rooftop garden will be carried out and completed separately.

Internal Perspective: The internal structural beams and columns for located at lower floors.



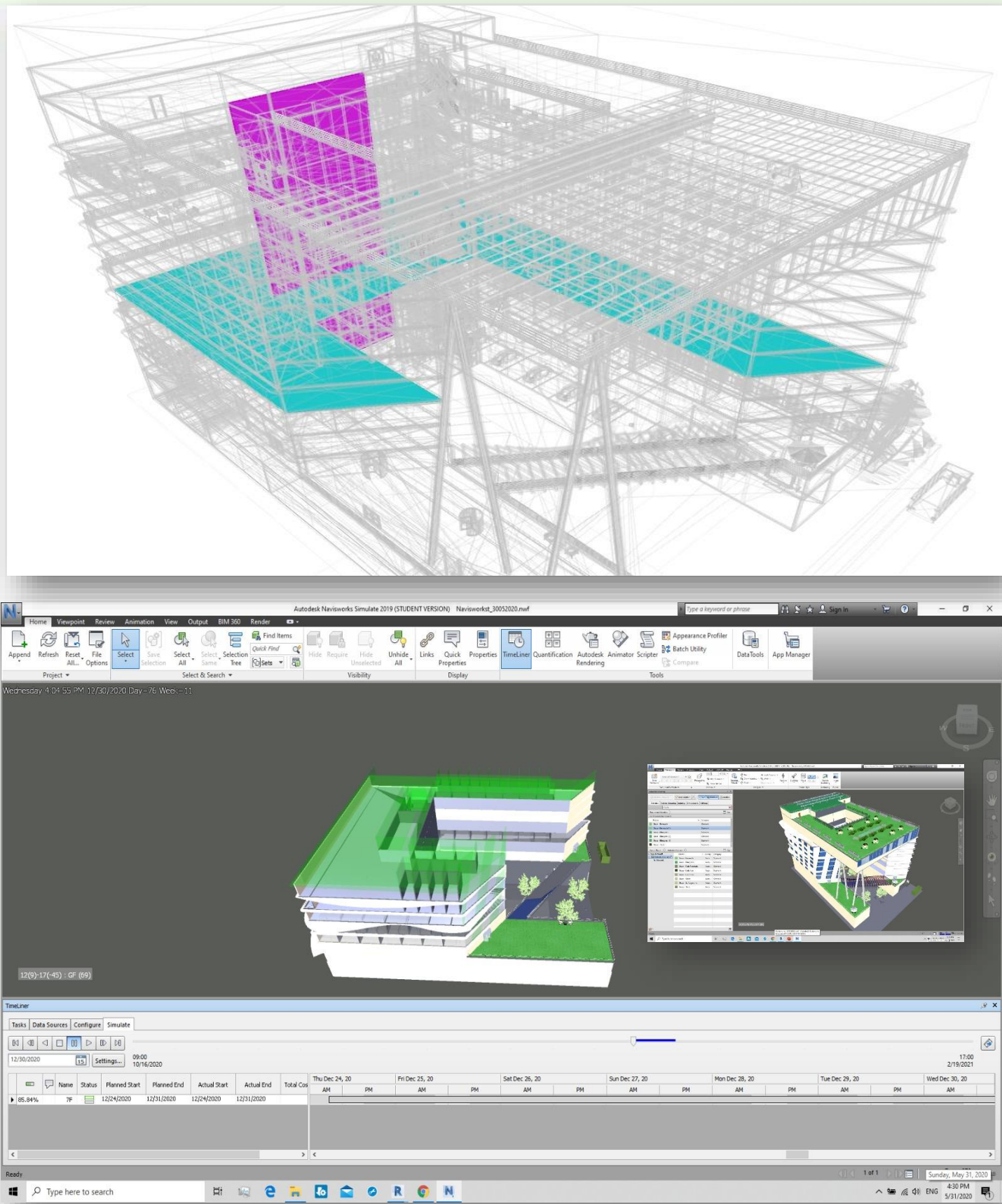
Warning
Analytical / Physical Model Consistency check is complete.

Computational Design : Using the structural template provided by Revit, a consistency test and supportiveness test were carried out where the basic calculations were completed by the software automatically. In our progression, the supportiveness test failed, upon wich remedial measures against the failure have been undertaken.

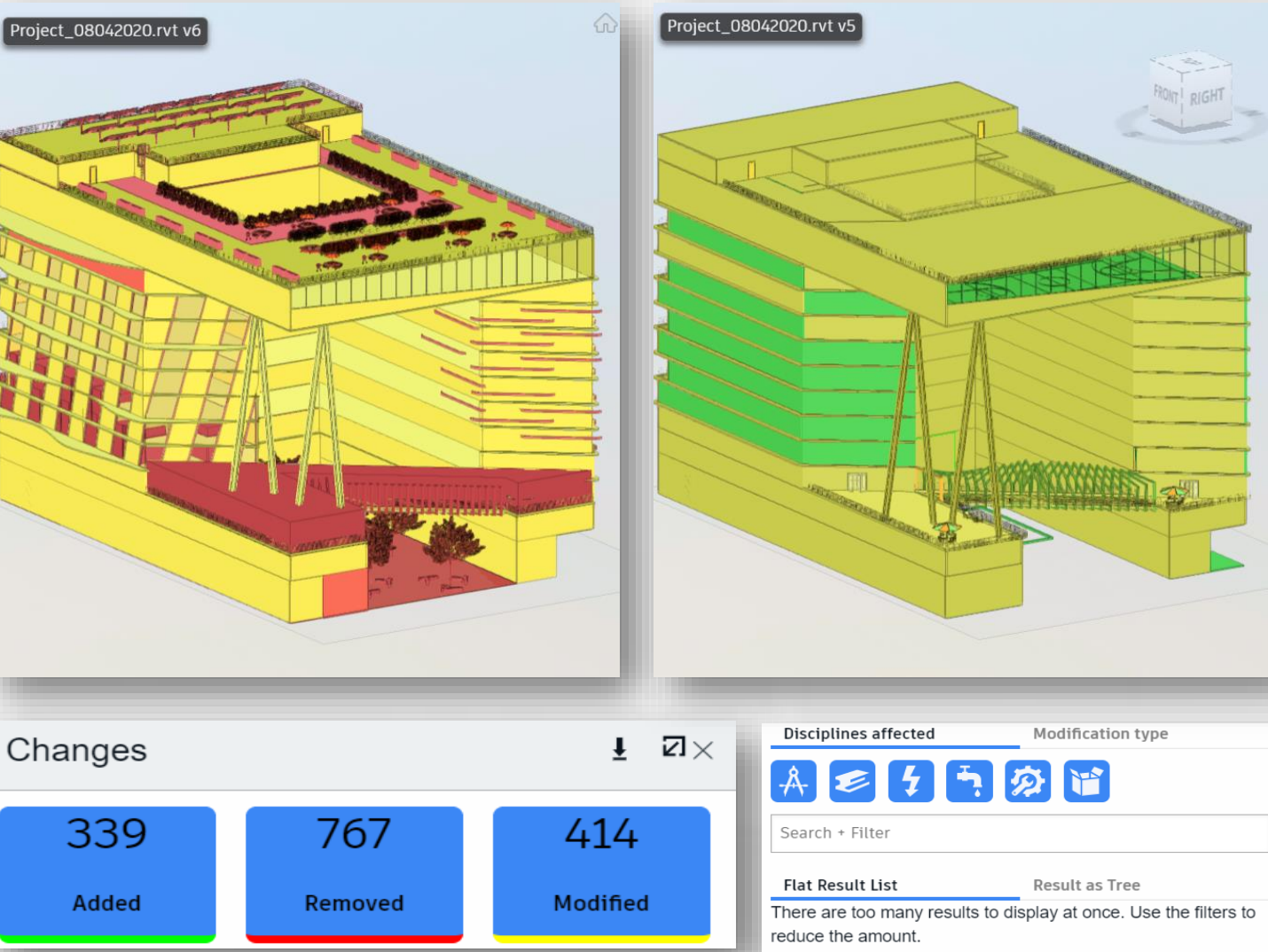


Sectional View: The cross-sectional elevation of the structural arrangement.

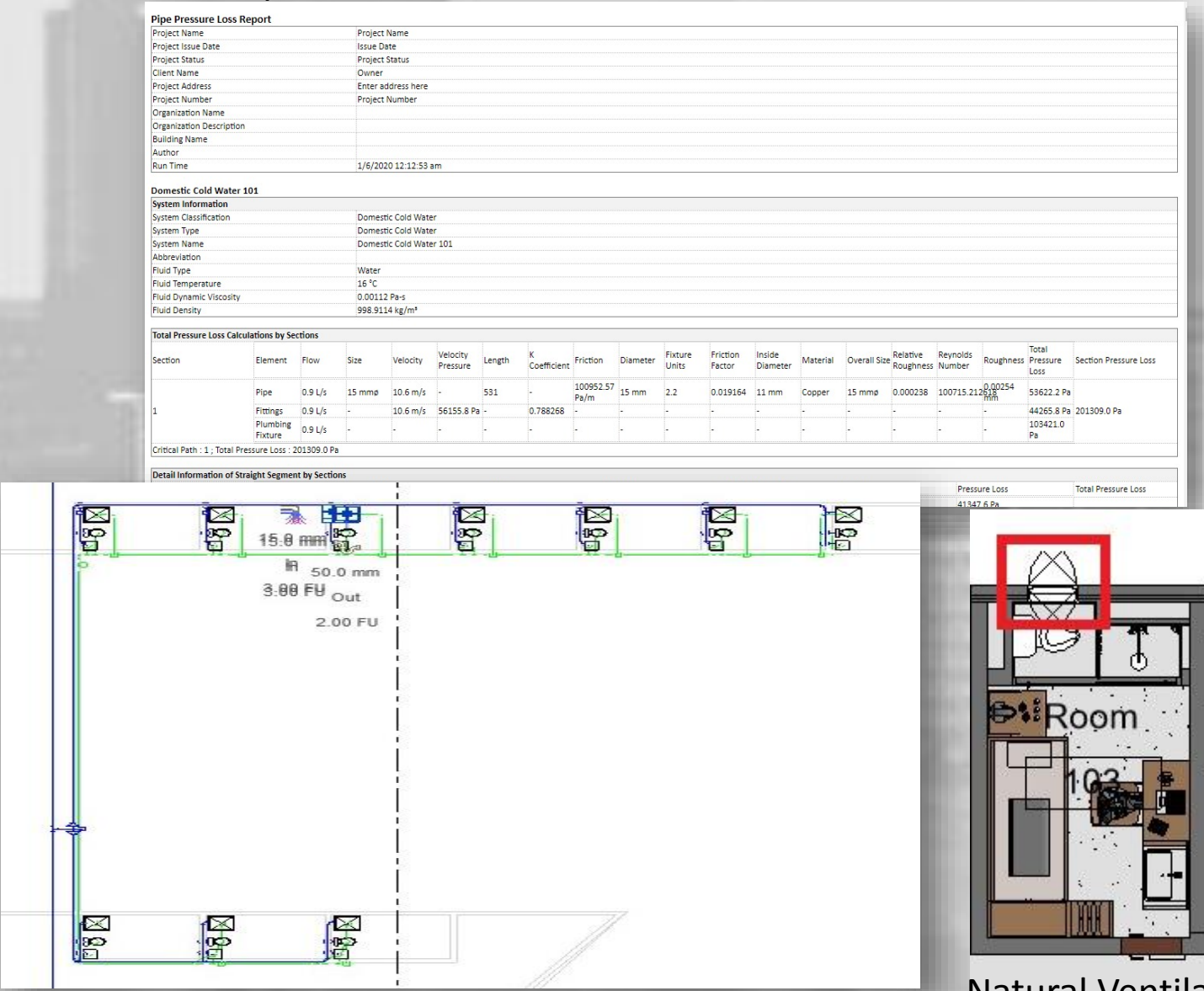
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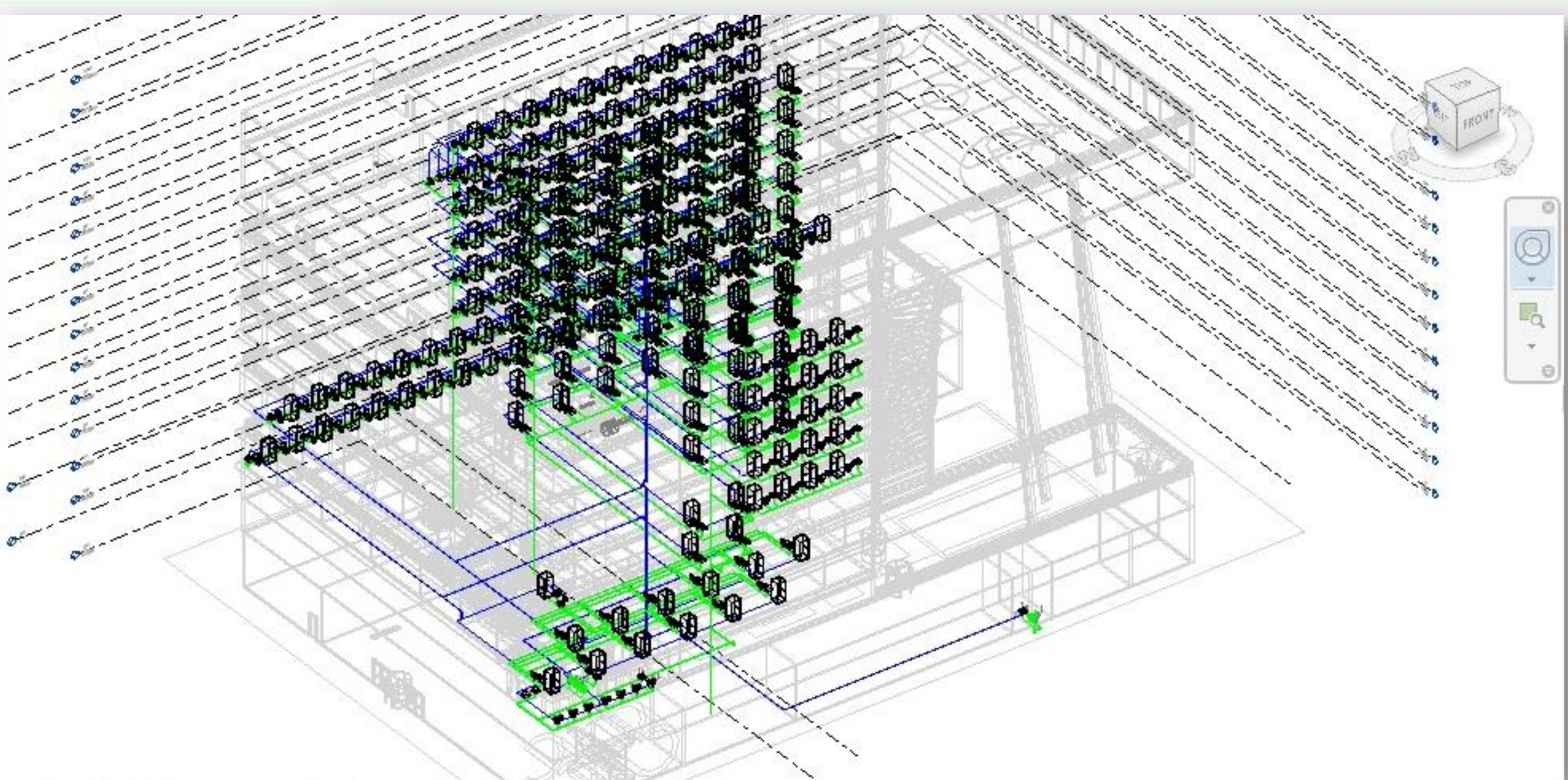
Design Coordination:
The rvt. file was imported into Naviswork for design coordination analysis. Naviswork was used for detecting conflicts between architectural, structural and MEP models. For example, pipes that are incompatible with ceilings can be discovered and relocated. To guarantee the degree of pleasance on the building outlook, we endeavour to conceal the pipe system to its utmost to the residing individuals and the passers-by. The distance between system is minimized (for both the same floor and consecutive floors), mitigating the disturbance to the facility users.



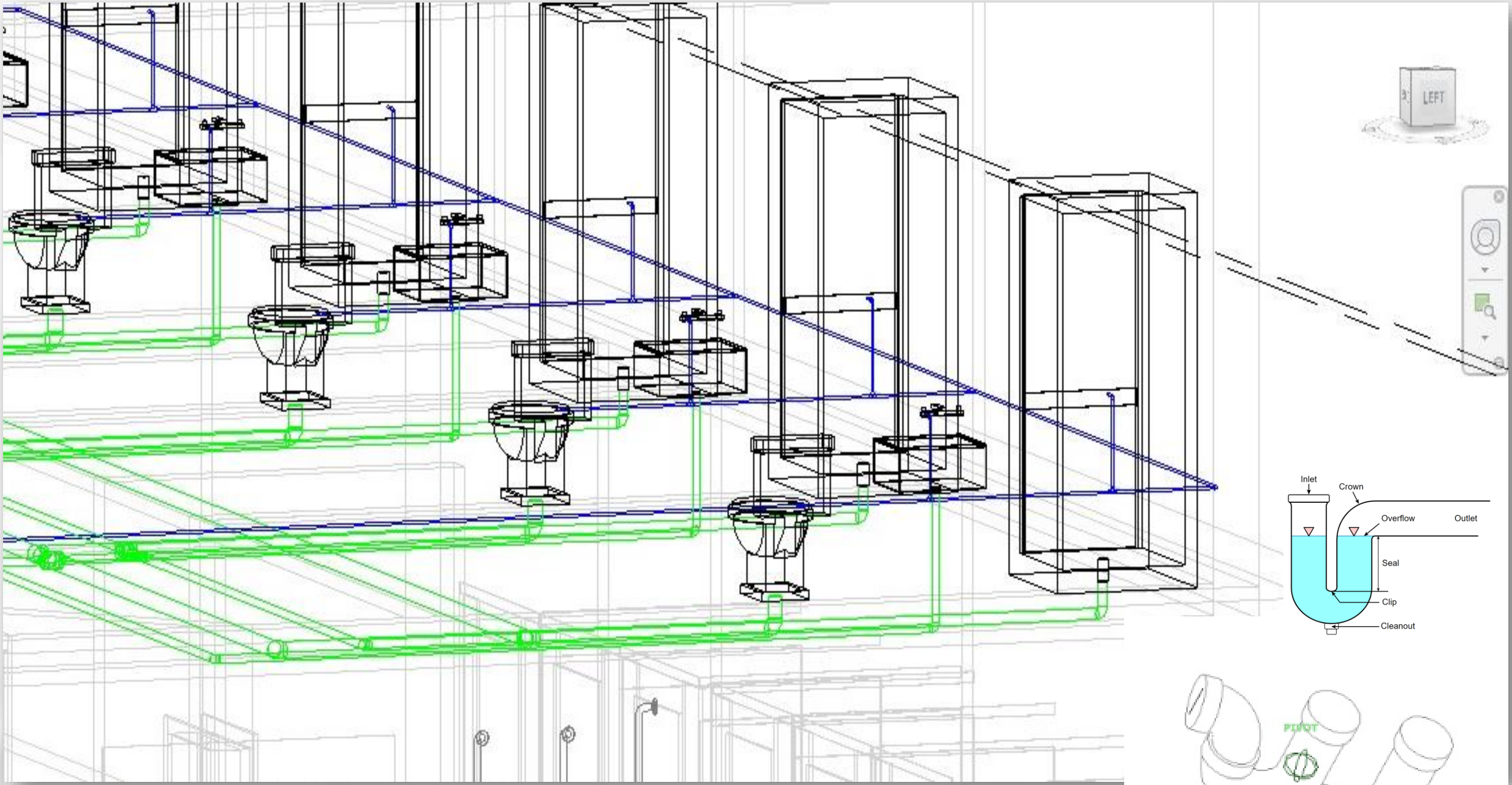
Project Team Collaboration:
Regarding the planning and establishment of the MEP based on the Architectural Model, our team collaborated mainly digitally via BIM 360 and Skype platforms, sharing our insights on the Building Design and the possible impacts on the Building System. Notably, BIM 360 was used for centralized documentation of files on the cloud platform. It allows version control and comparison by which we were able to visually understand what changes were made to the earlier version of designs by other teammates. More importantly, with BIM360, we can point out, circle and highlight changes that are undesirable, subject to modification or yet to be done on BIM360 platform.



Computational Design : The Building Service System stems from a Computational Design that the practical use and user experience is considered with several arrangement optimizations. Pressure Loss Analysis was conducted for the Pipe System that they are in good and workable status.



Perspective View: The MEP model above includes the Plumbing System in Building Service System of the Student Hostel (i.e. pipe system of the cold water and the drainage in the toilets, pantry and the water tank are illustrated). It was accomplished by researches of relevant industry practices.



U traps & W traps are provided to prevent the transmission of bacteria and virus

Internal Perspective: The illustrative image of a bathroom (with a shower basin with enclosing screens, a toilet set, a water tap and a washing basin) is presented above. The pipes highlighted in green indicate drains while pipes highlighted in blue indicate the freshwater supply pipe systems. As residential units are similar, the bathroom fittings are repeatedly arrayed room by room. The above diagram on the right shows the errors occurred at the initial stage, which then resolved in the later stages.



Sectional View: The illustration above indicates the arrangement of the plumbing system throughout the hostel in compliance with the British Standard Code of Practice BSEN 12056-2:2000 under Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulation (Cap. 1231).