Location Plan 1:2000

SITE

Design Concept :

The objective of the project is to design a Construction Innovation Campus that serves as a a future expansion of the Construction Industry Council's Construction Innovation and Technology Application Centre (CITAC). The campus is intended to be space for promoting digital technology to the public and the architectural industry.

Our group's vision is to create a curated ecosystem of ambitious engineers, technicians & entrepreneurs of all generations to help build and promote the future of innovation for the industry. The proposed campus will be intended to foster idea exchanges, accelerate the growth of the construction industry, while catalyzing joint research between businesses, education institutes & public sector.

Building Form & Spatial Arrangement :

Our team initially incorporated a rectangular shaped mass as the foundation

Connectivity :

The proposed

BIM Approach :

For this project, our group utilized BIM software such as Revit for creating architectural, structural, and MEP models. The use of Revit was very supportive & helpful where our models can be altered and updated at an instance. In addition, with the use of Trimble Connect, our group was able to communicate & work efficiently during our design modelling stage.

Design for Manufacturing & Assembly :

Proposed rooms and facilities which have the similar size requirement, such as classrooms, workshops, computer labs, are proposed with a prefabrication & assemble building method that allows to minimize the construction impact towards the nearby surroundings. In addition, in terms of façade design, the curtain wall panel system is also proposed with the similar building method.

Sustainability :

Based on the principles of "sustainable design" in which to reduce energy use & thermal emission, the design of the Construction Innovation Campus incorporates the use of passive design and active system strategy. In terms of passive design, a large void in the middle acts as the main atrium of the building. The intention of the void is to increase the amount of natural light penetration and cross ventilation effect. In addition, solar shading devices are also applied on building surfaces that are facing south. In terms of active system,

Constructability :

In terms of the construction & structural aspect of the project, the use of reinforced concrete grid frame system, our team adopted the use of Revit & SAP-2000 as an analytical tool to understand the loading performances.
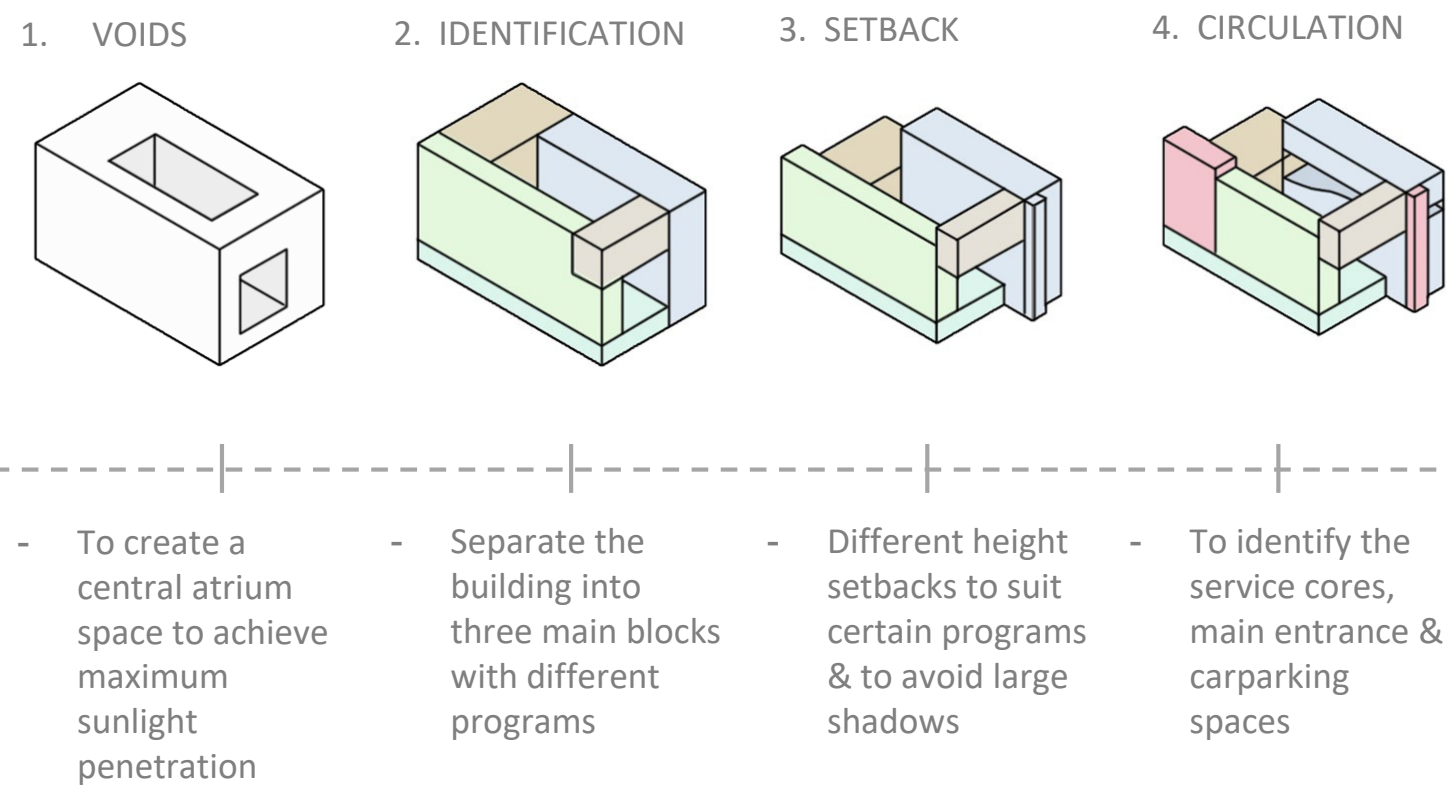
Safety Planning :

After the model federation, our group equipped with 4D BIM technologies with the likes of Autodesk Naviswork, to carry out 4D simulation to identify possible safety issues of the digital model. This allows our group to understand the particular areas that need to be considered. For example, the incorporation of Autodesk Naviswork helps us to be aware of any form of clashes between structural components & building service systetms.

Conceptual Diagram :

According to the conceptual diagram, the main intention of our architectural idea was to maximise the penetration of sunlight and the connectivity between the height differences of the proposed site.
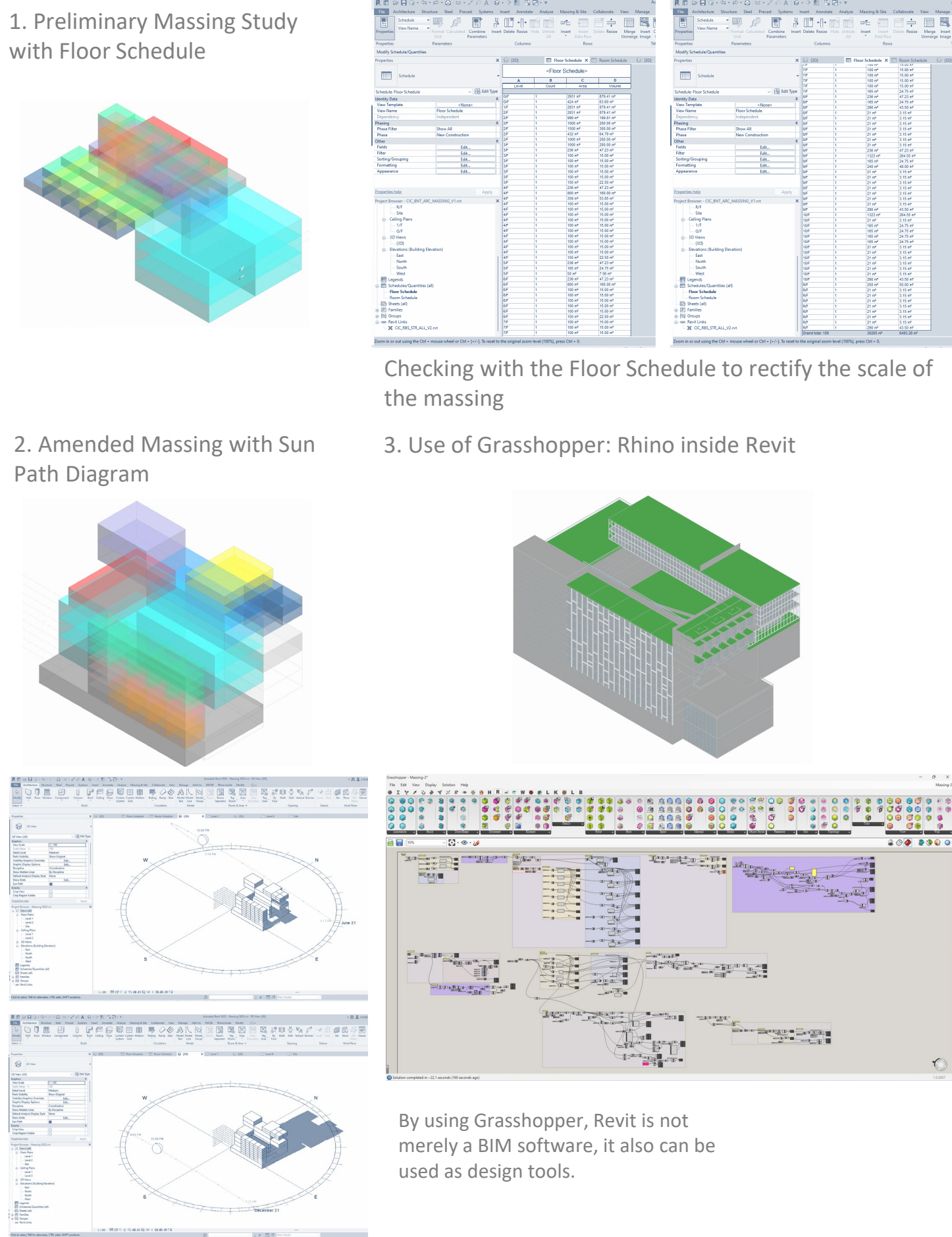
Campus Building

Design Massing Development

1. VOIDS
2. IDENTIFICATION
3. SETBACK
4. CIRCULATION

- To create a central atrium space to achieve maximum sunlight penetration
- Separate the building into three main blocks with different programs
- Different height setbacks to suit certain programs & to avoid large shadows
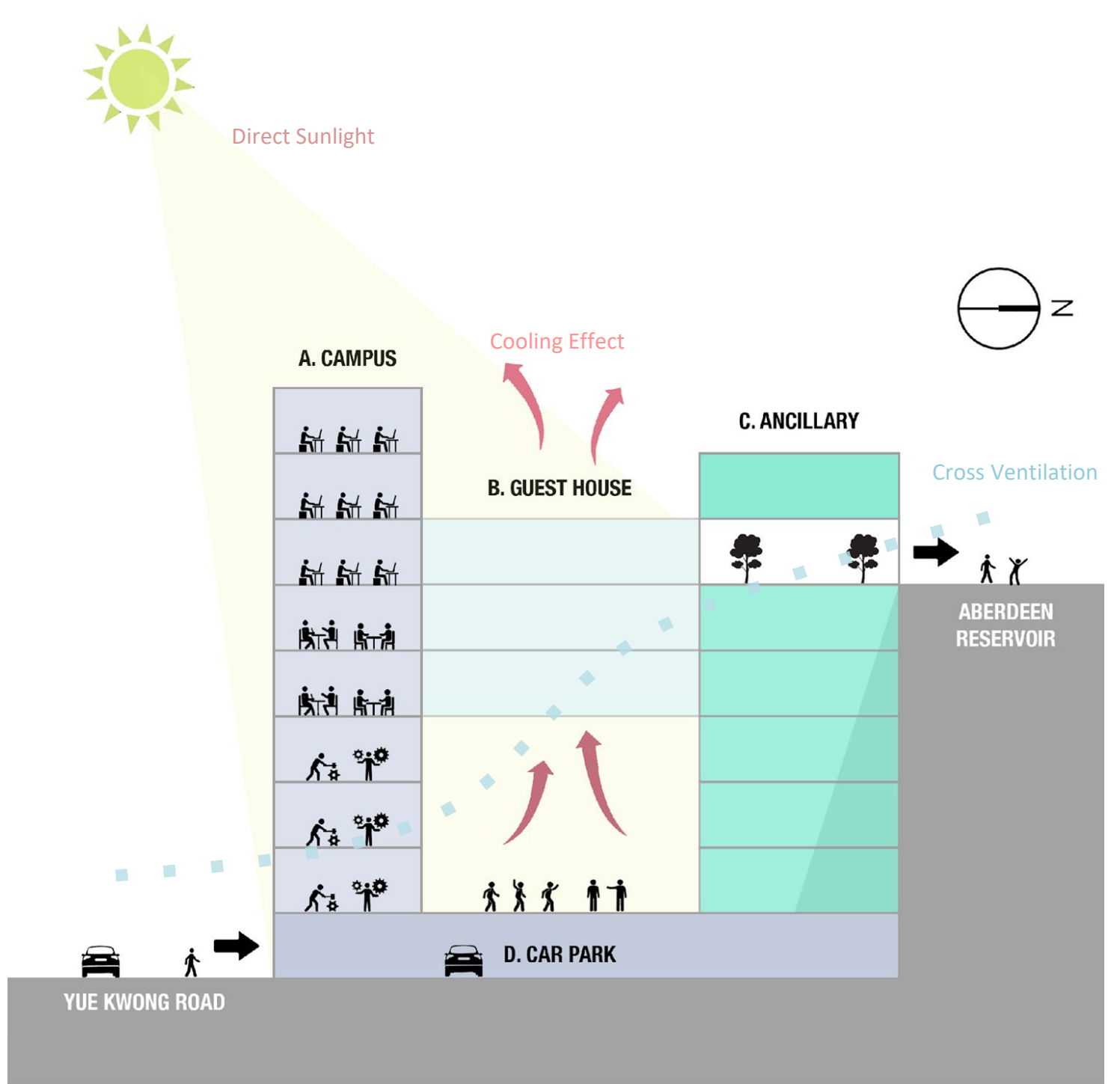- To identify the service cores, main entrance & carparking spaces

Building Form and Space: Considering the proposed site is situated on a sloped landscape, our group decided to the building form is placed along the sloped surface.

Design Process

1. Preliminary Massing Study with Floor Schedule

Checking with the Floor Schedule to rectify the scale of the massing

2. Amended Massing with Sun Path Diagram

3. Use of Grasshopper: Rhino inside Revit

By using Grasshopper, Revit is not merely a BIM software, it also can be used as design tools.
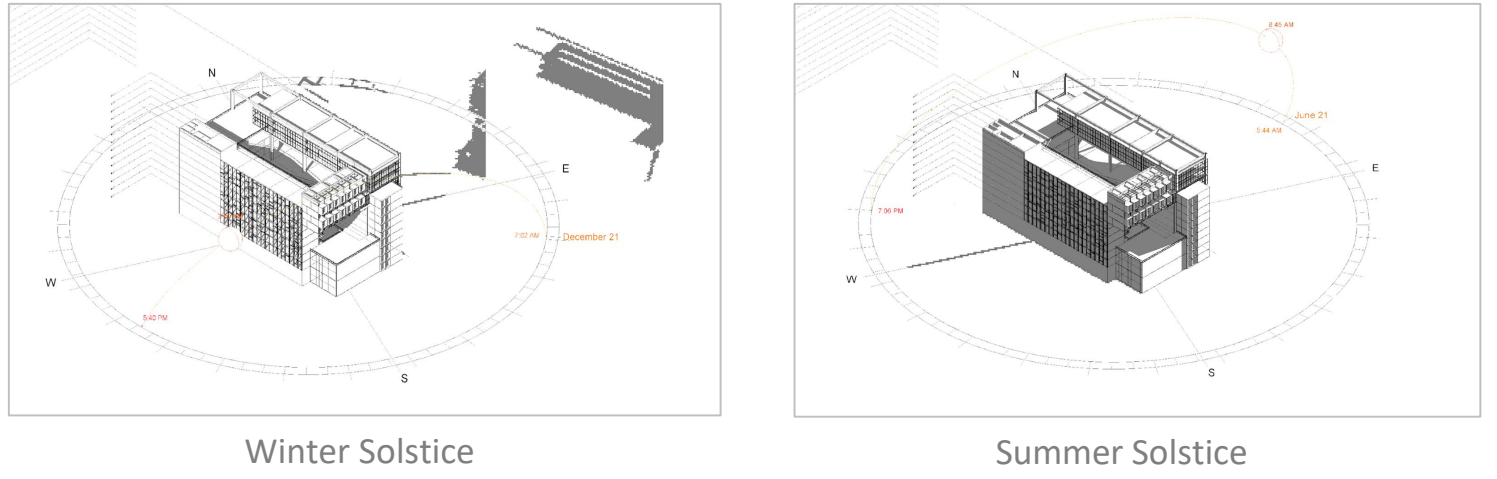
Quality: By using the schedule from Revit, automatic calculations of the spatial requirements helps to adjust the scale of the massing, and the use of sun path diagram to determine the orientation of the proposed design.
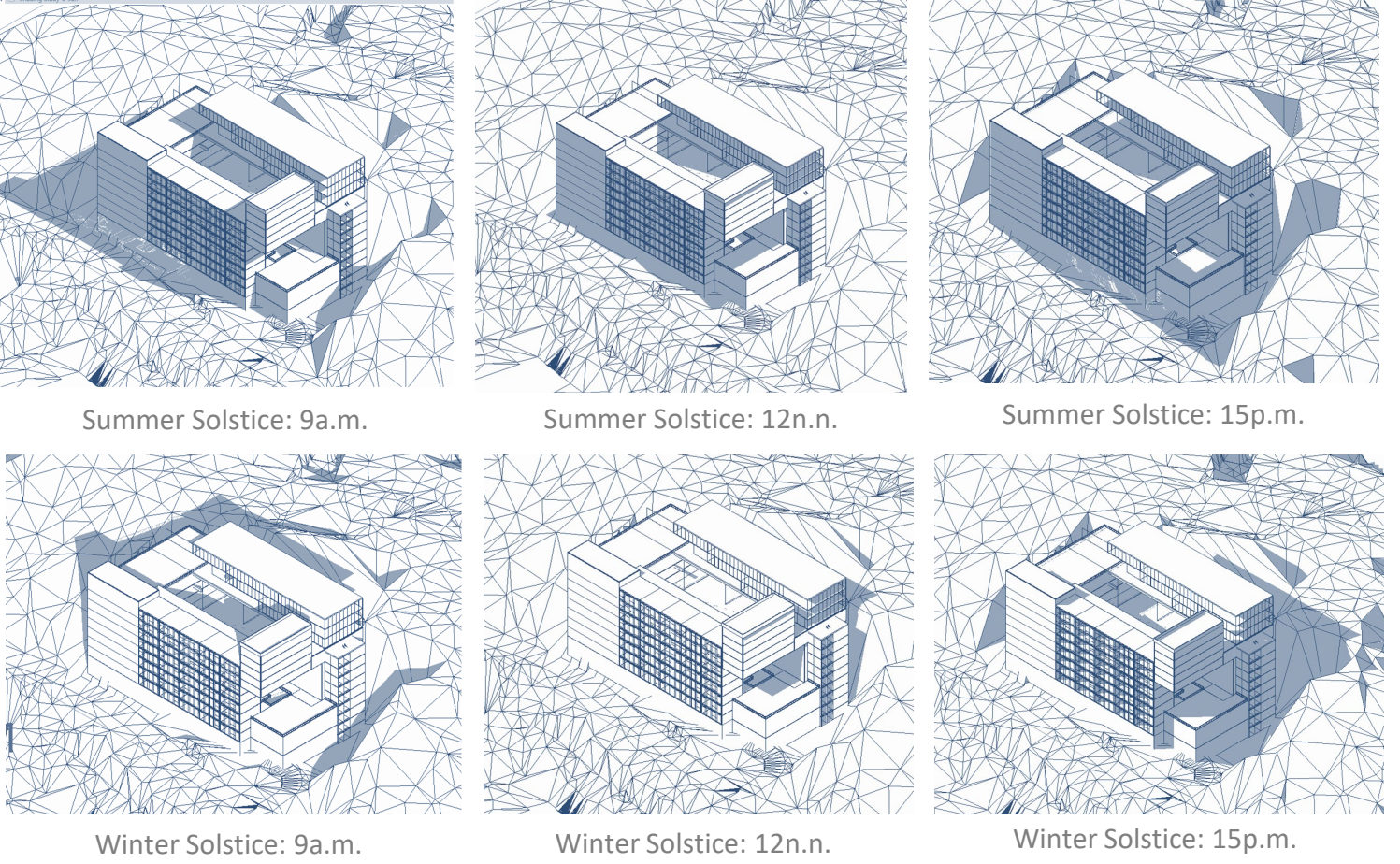

Direct Sunlight

Cooling Effect

A. CAMPUS
B. GUEST HOUSE
C. ANCILLARY

Cross Ventilation

ABERDEEN RESERVOIR

D. CAR PARK

YUE KWONG ROAD

Sectional Diagram

Sun Path Diagram

Winter Solstice

Summer Solstice

Sun Shading Study

Summer Solstice: 9a.m.

Summer Solstice: 12n.n.

Summer Solstice: 15p.m.

Winter Solstice: 9a.m.
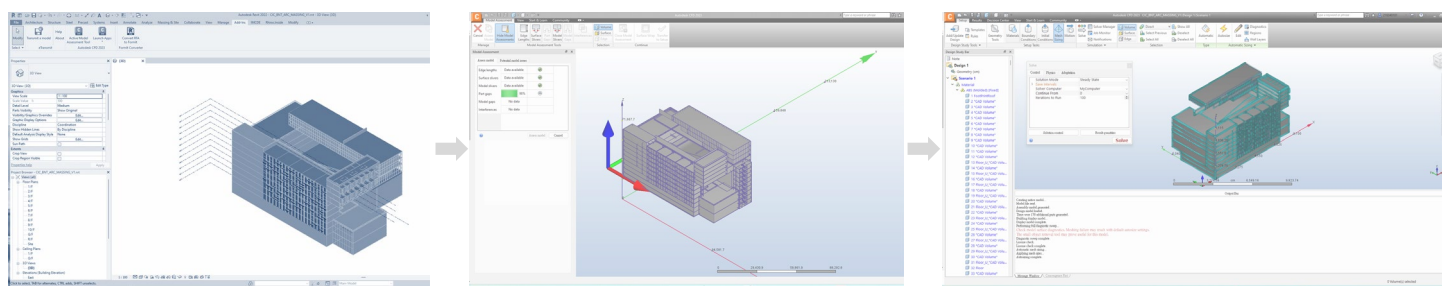
Winter Solstice: 12n.n.

Winter Solstice: 15p.m.

Sustainability: In terms of the sustainability approach with the environment, the massing and spatial organization of the building were based on the existing sun path and natural lighting

Site Layout Plan 1:1000

Note:
1. Please put in with min. 1:1000 Scale Site Layout Plan with simple shadow study analysis and delete this Note.
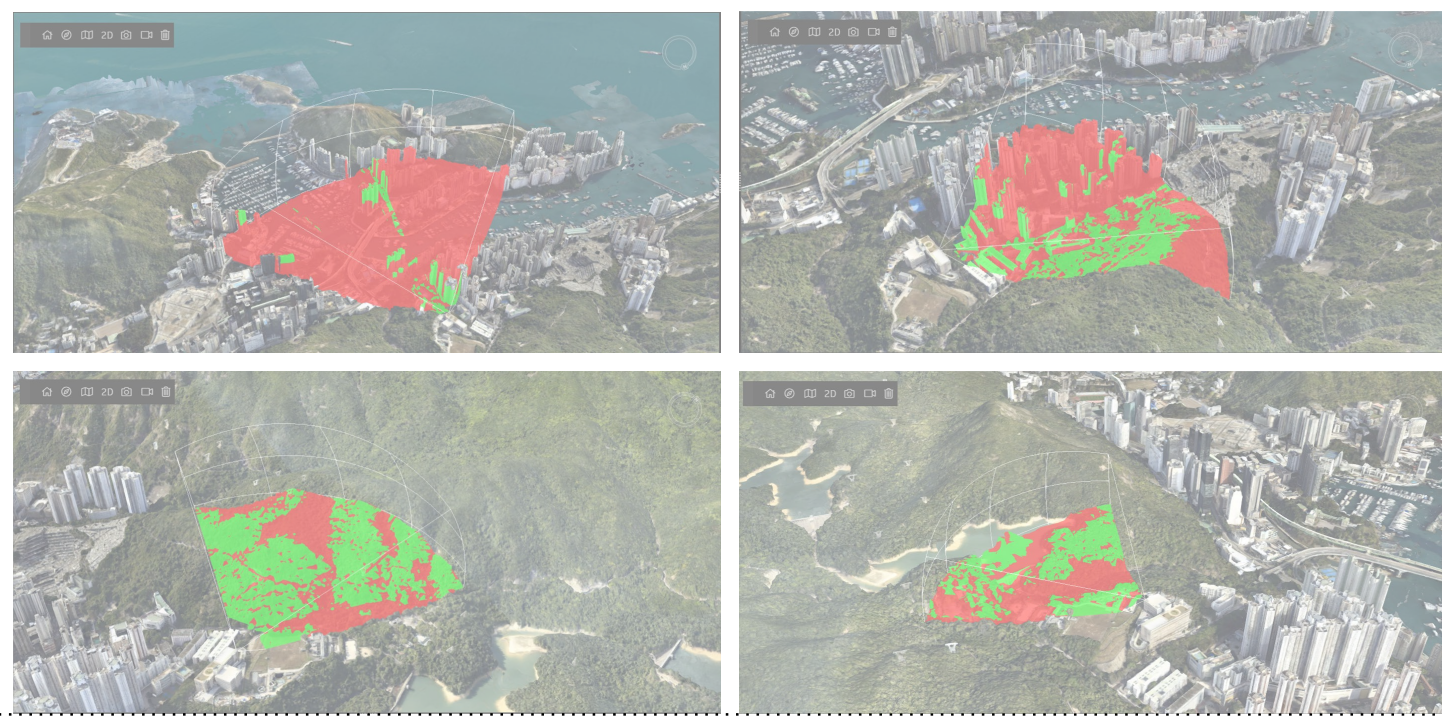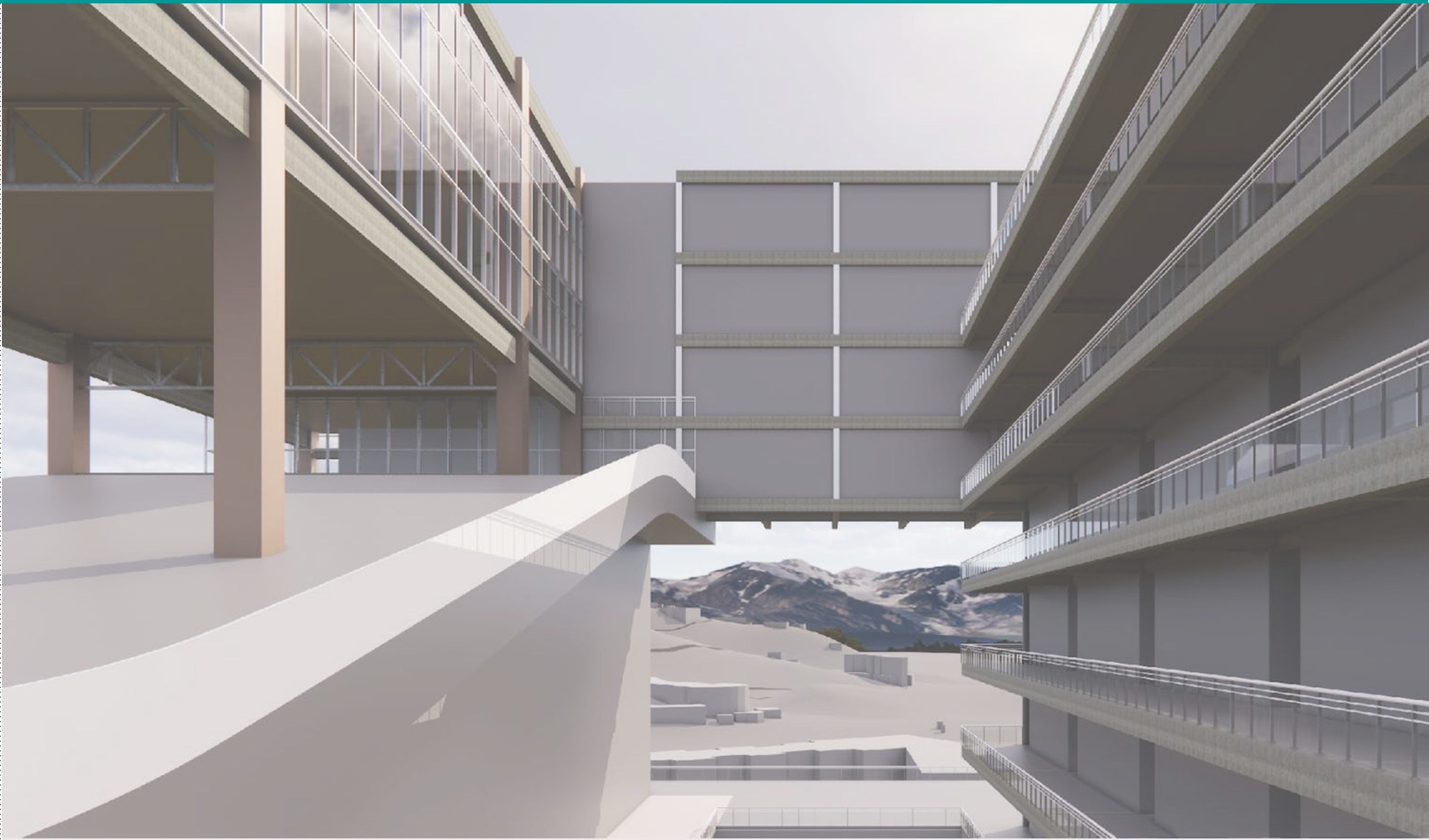
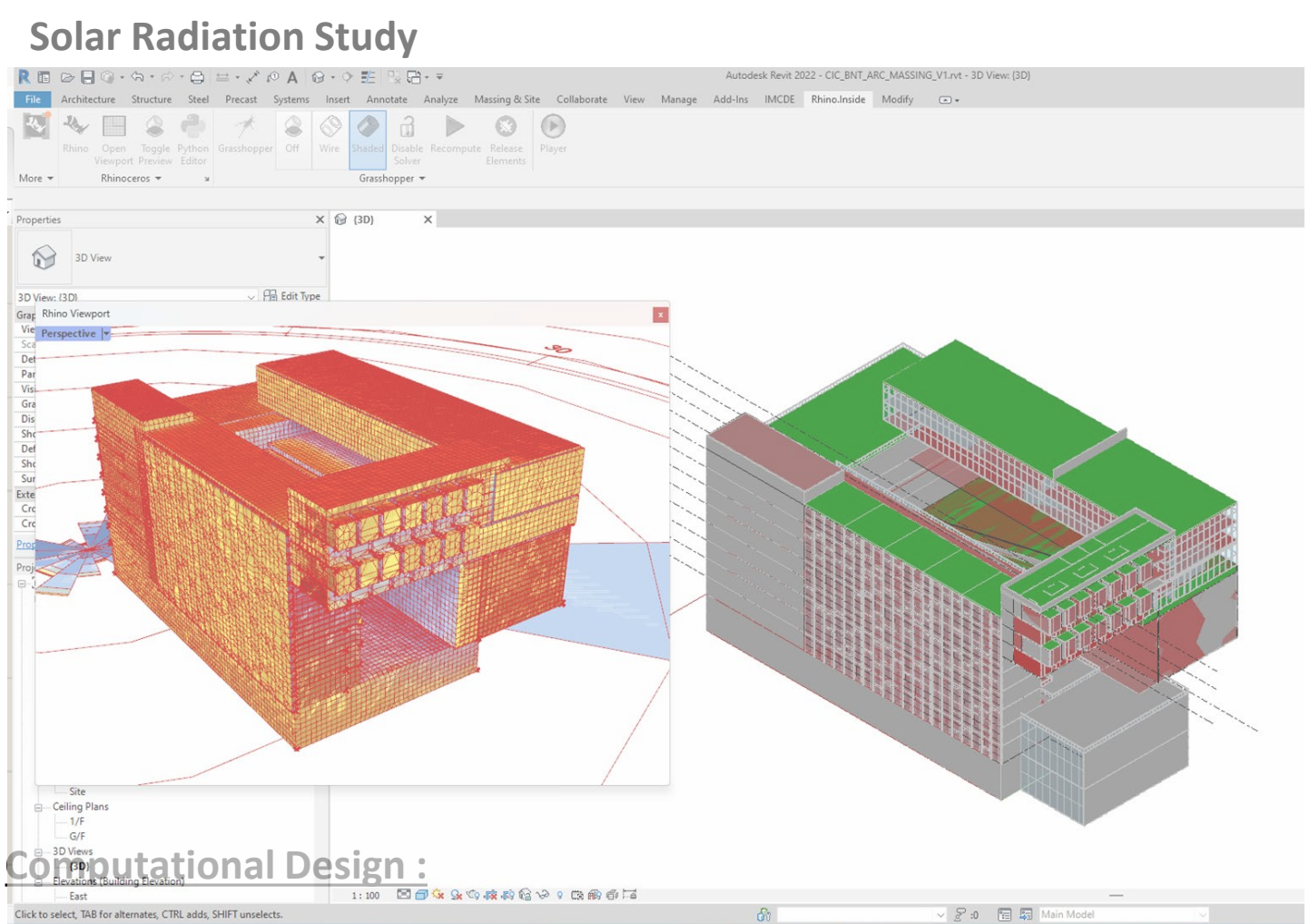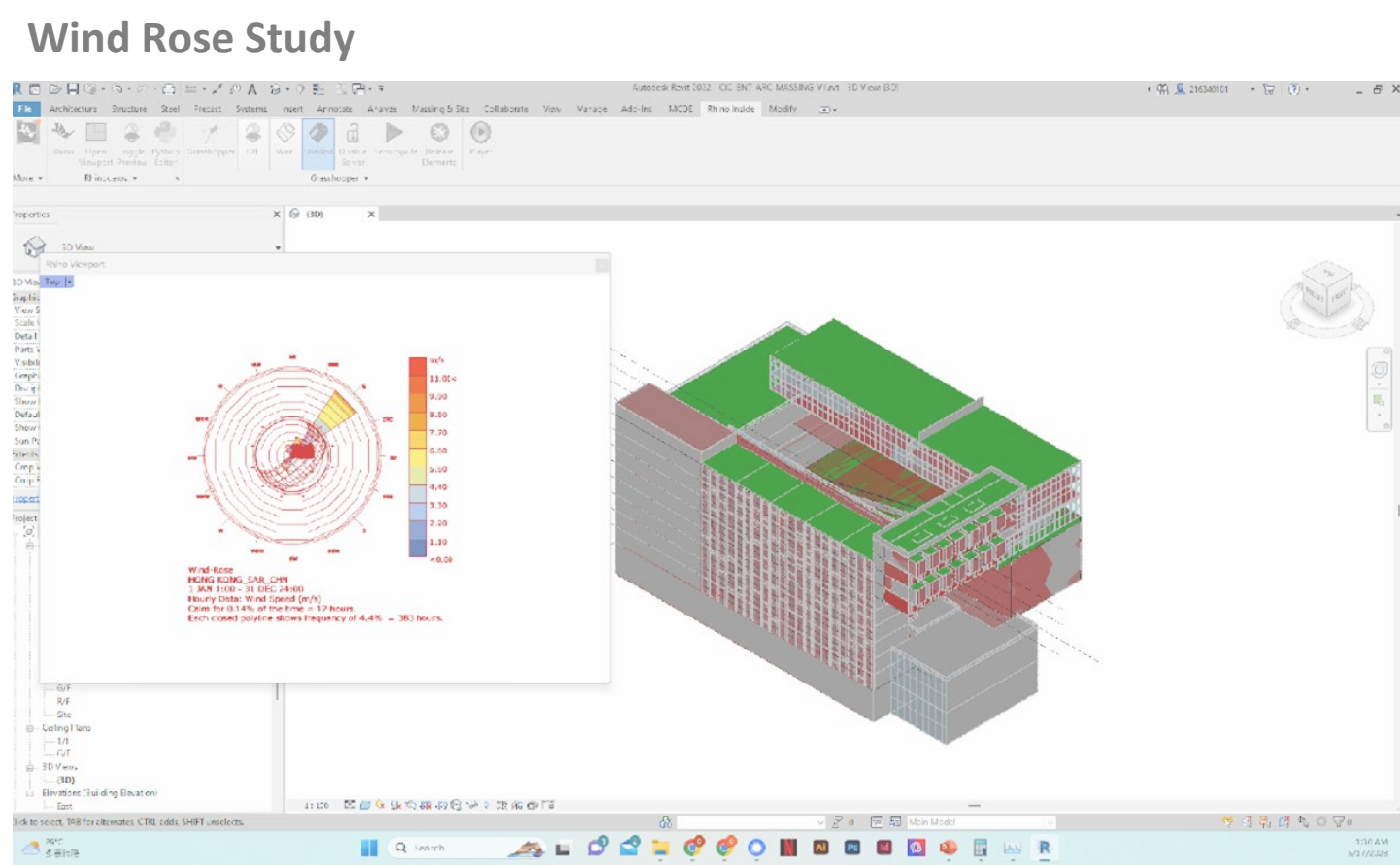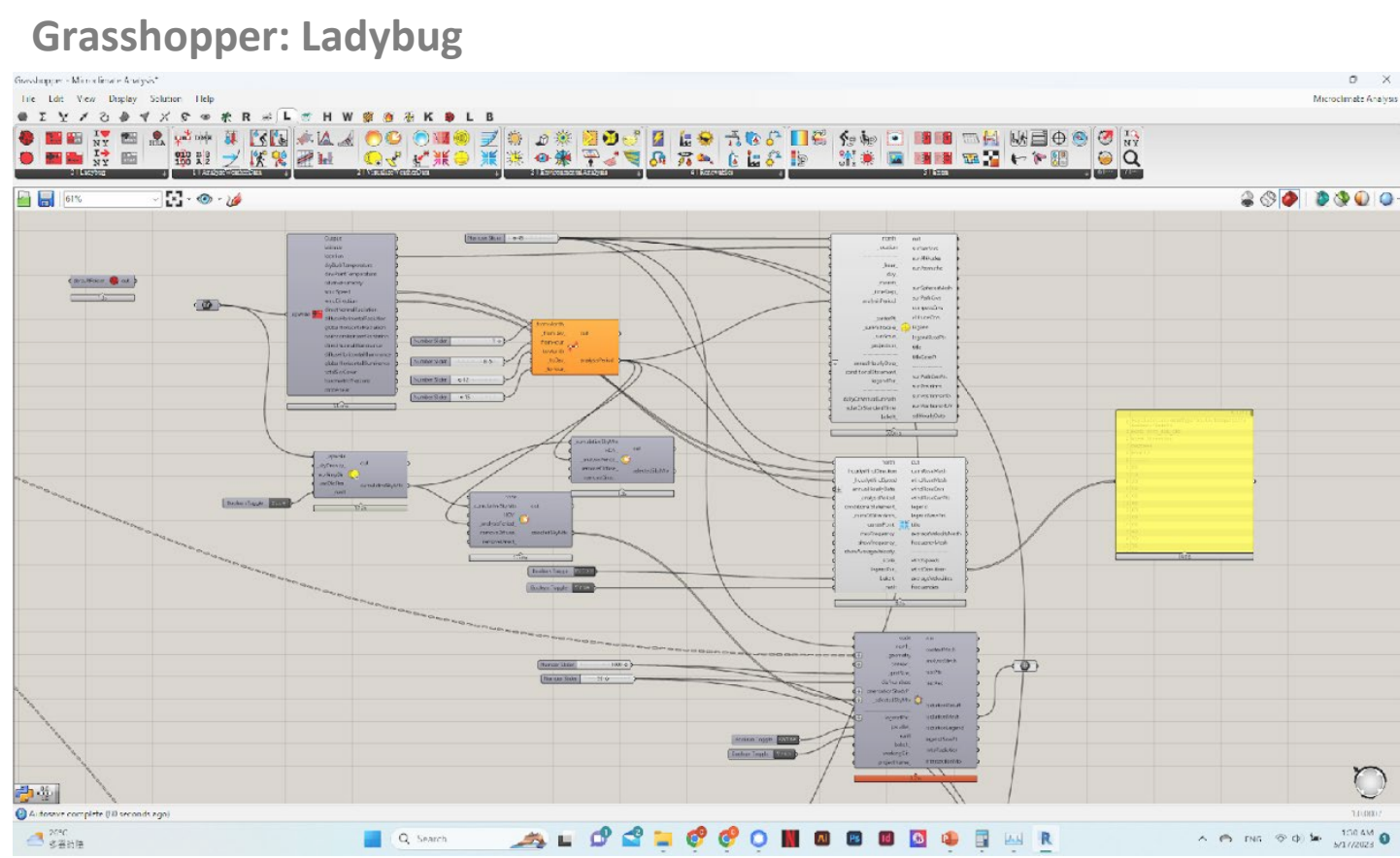**View Analysis Study :**

In terms of the

Wind Flow Study

1) Export in Revit through Add-Ins
2) Transferring Model automatically
3) Setting of Materials

View Analysis Study

Grasshopper: Ladybug

Wind Rose Study

Solar Radiation Study

Computational Design :

Since the overall building design was developed in BIM softwares.

gn: please put in textual description to describe BIM for computational design, analysis and optimisation approach (architectural). Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text

Perspective View: To provide the natural lighting & ventilation, the proposed design will provide a horizontal and a vertical tunnel to maintain thermal comfort inside the building and penetrate the light down to the street level.
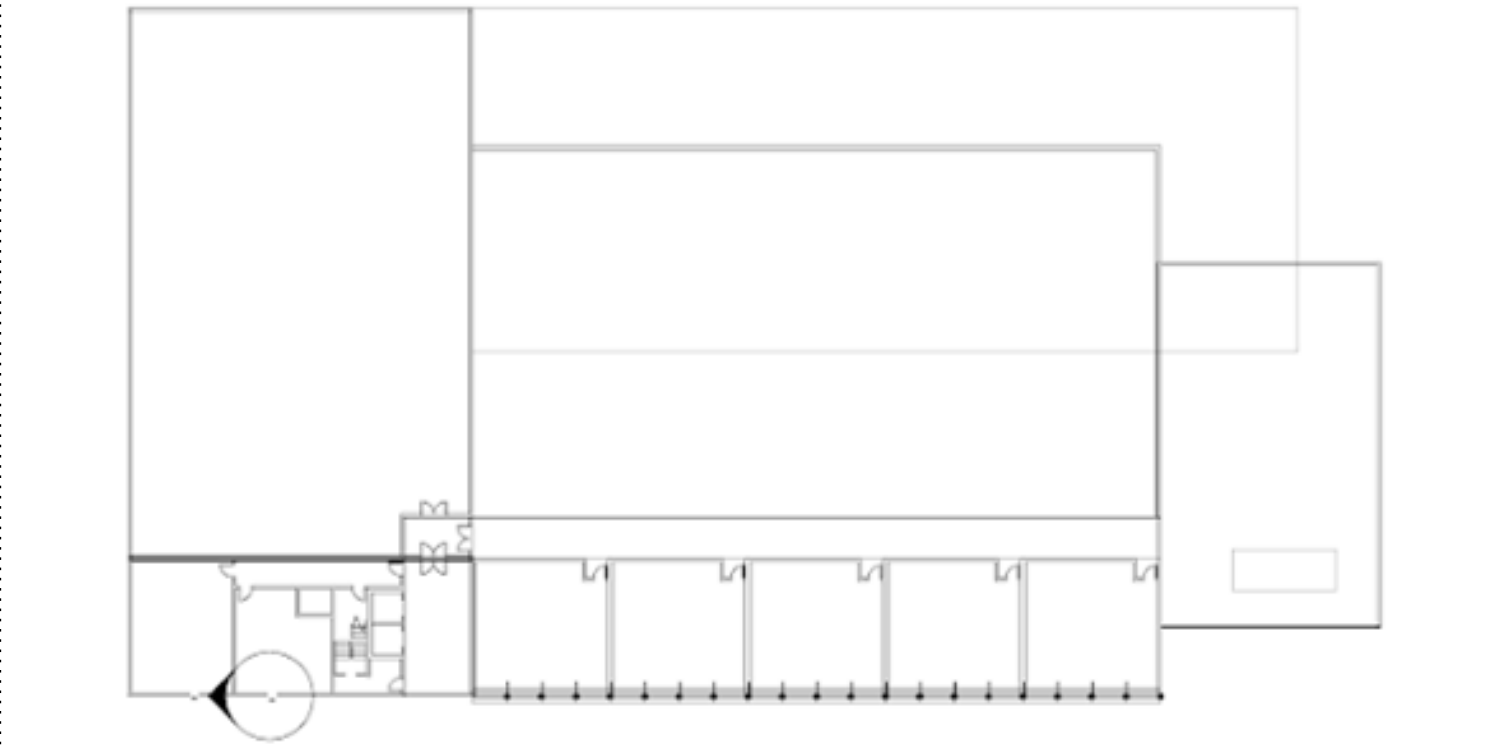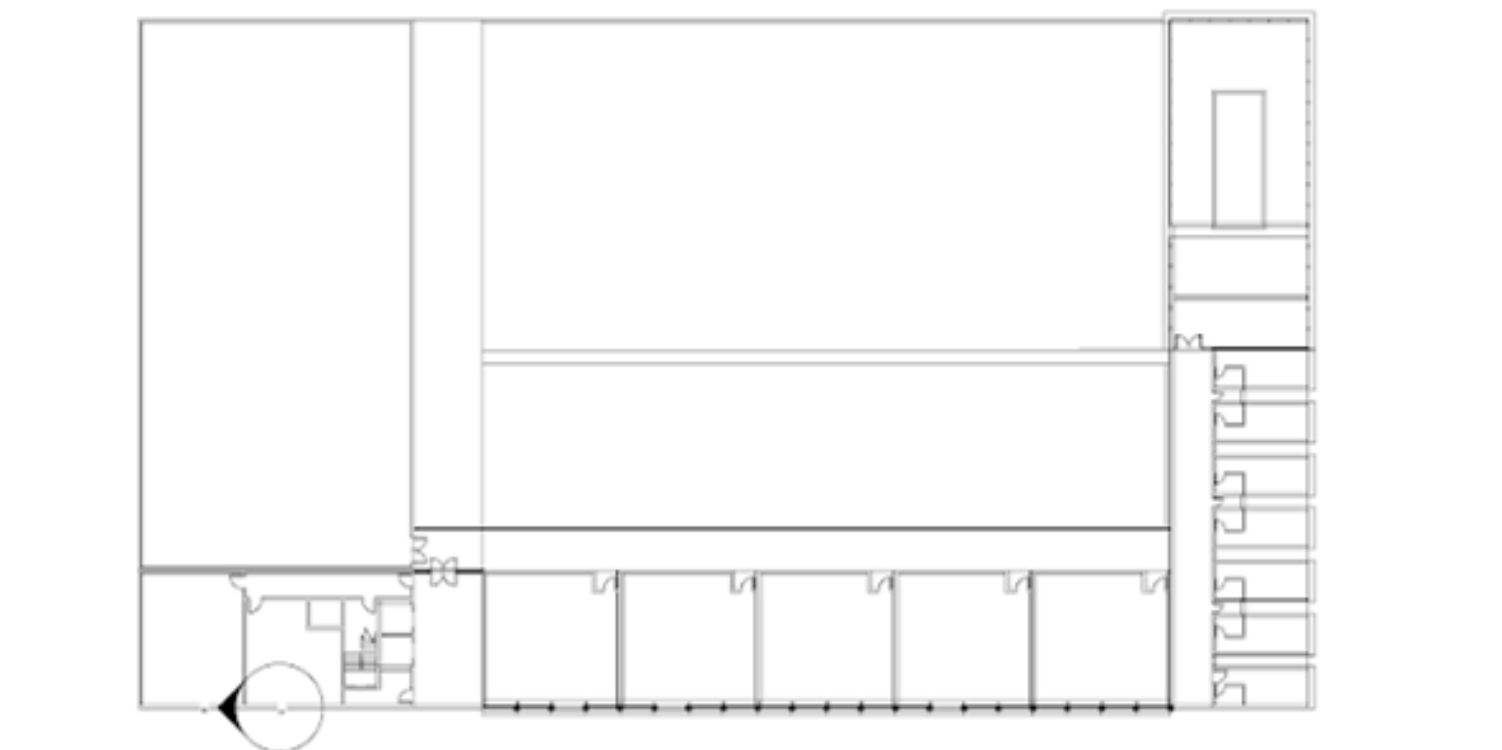

Second Floor Plan 1:500

Typical Floor Plan 1:500

Internal Perspective 1:500

Overall Bird Eye view (Night View)

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**MiC for the Guest House of the School**
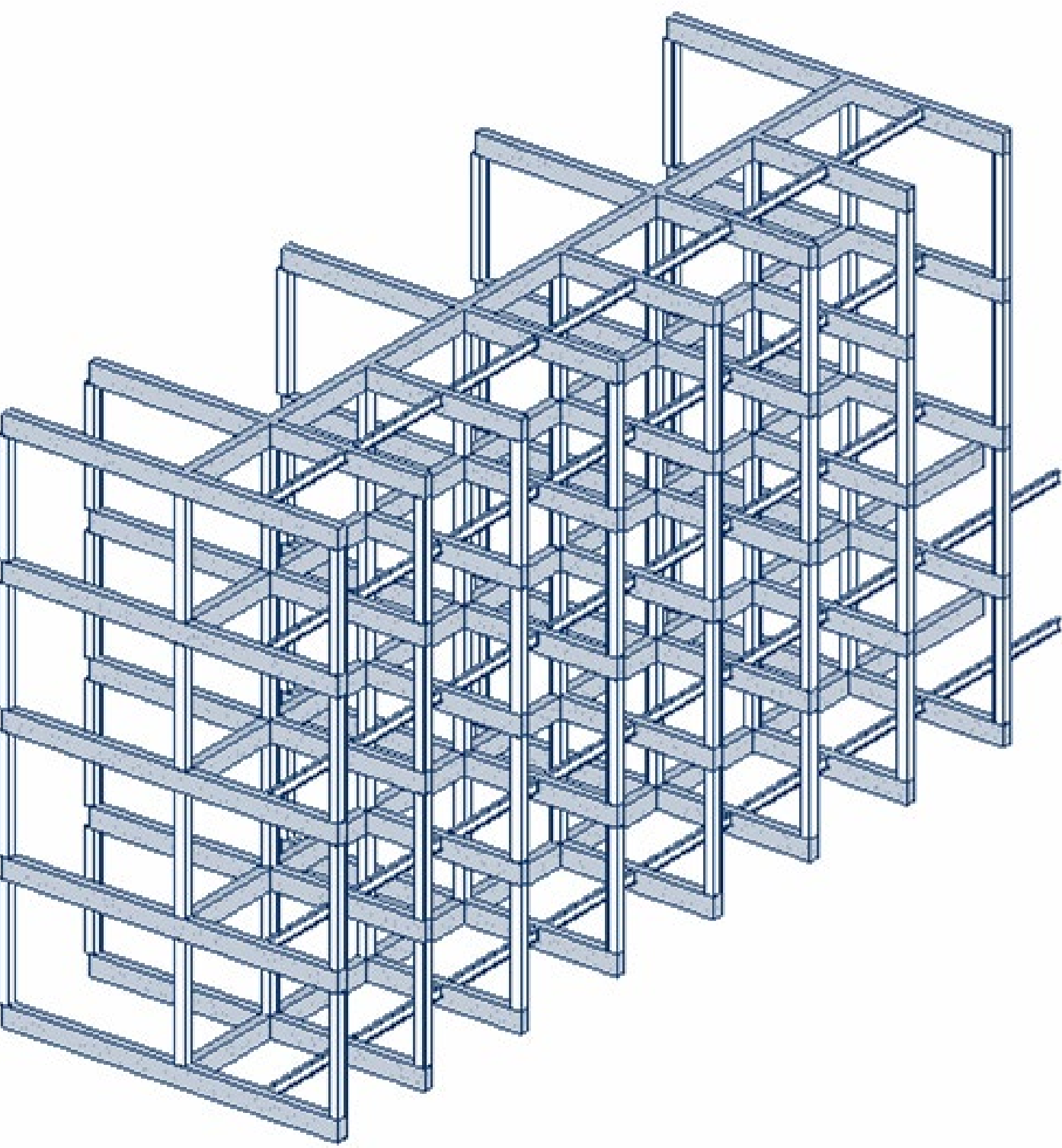
**DfMA for the Typical room which used for teaching**
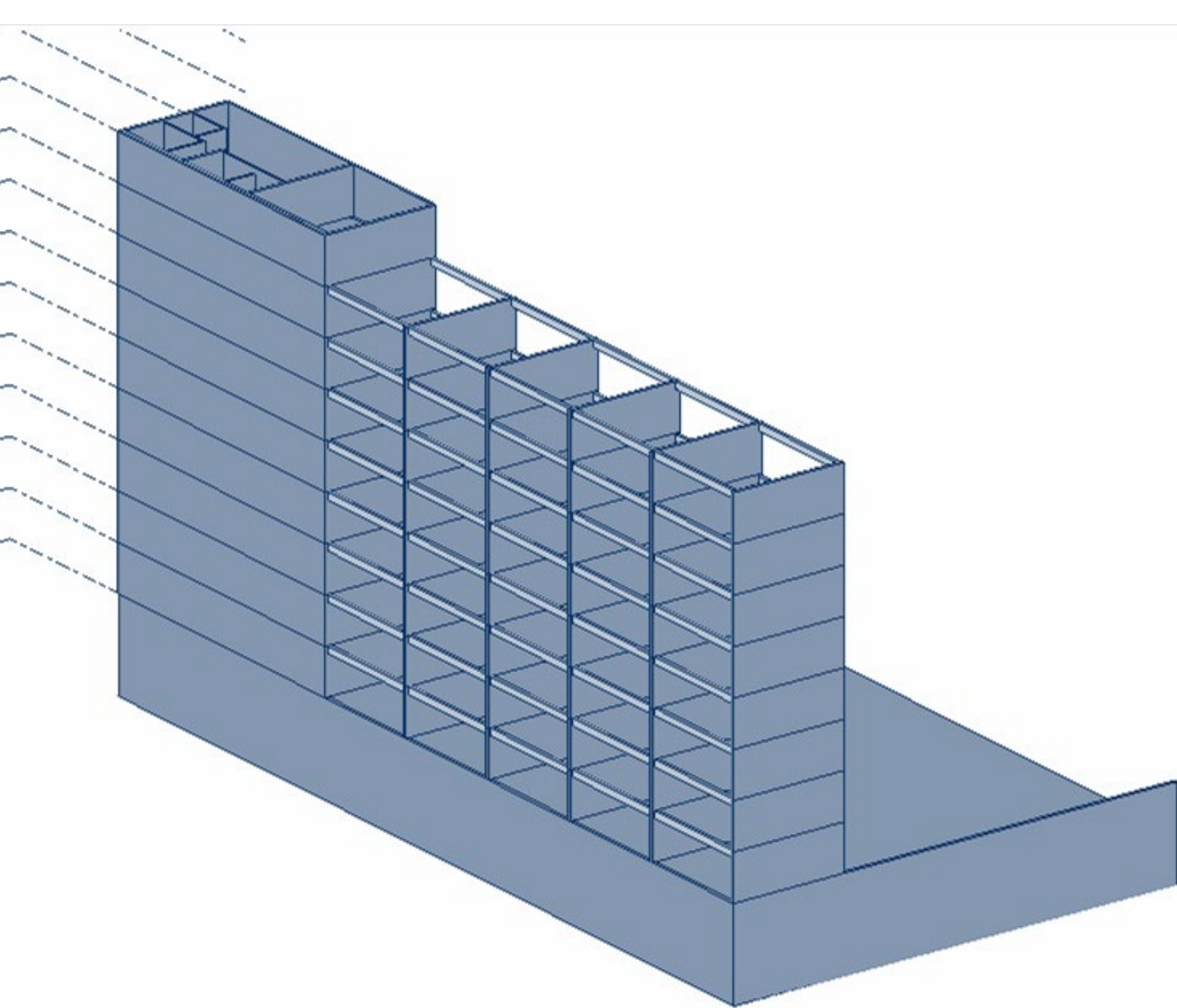
MiC, MiMEP and DfMA:

For this project, the use of MIC,MiMEP and DfMA were adopted into the use of room facilities on the south side. These rooms include the likes of classrooms, computer labs, workshops, and IT rooms, where they share the identical net operational floor area (NOFA) in 100 sqm

Structural Analytic Diagram
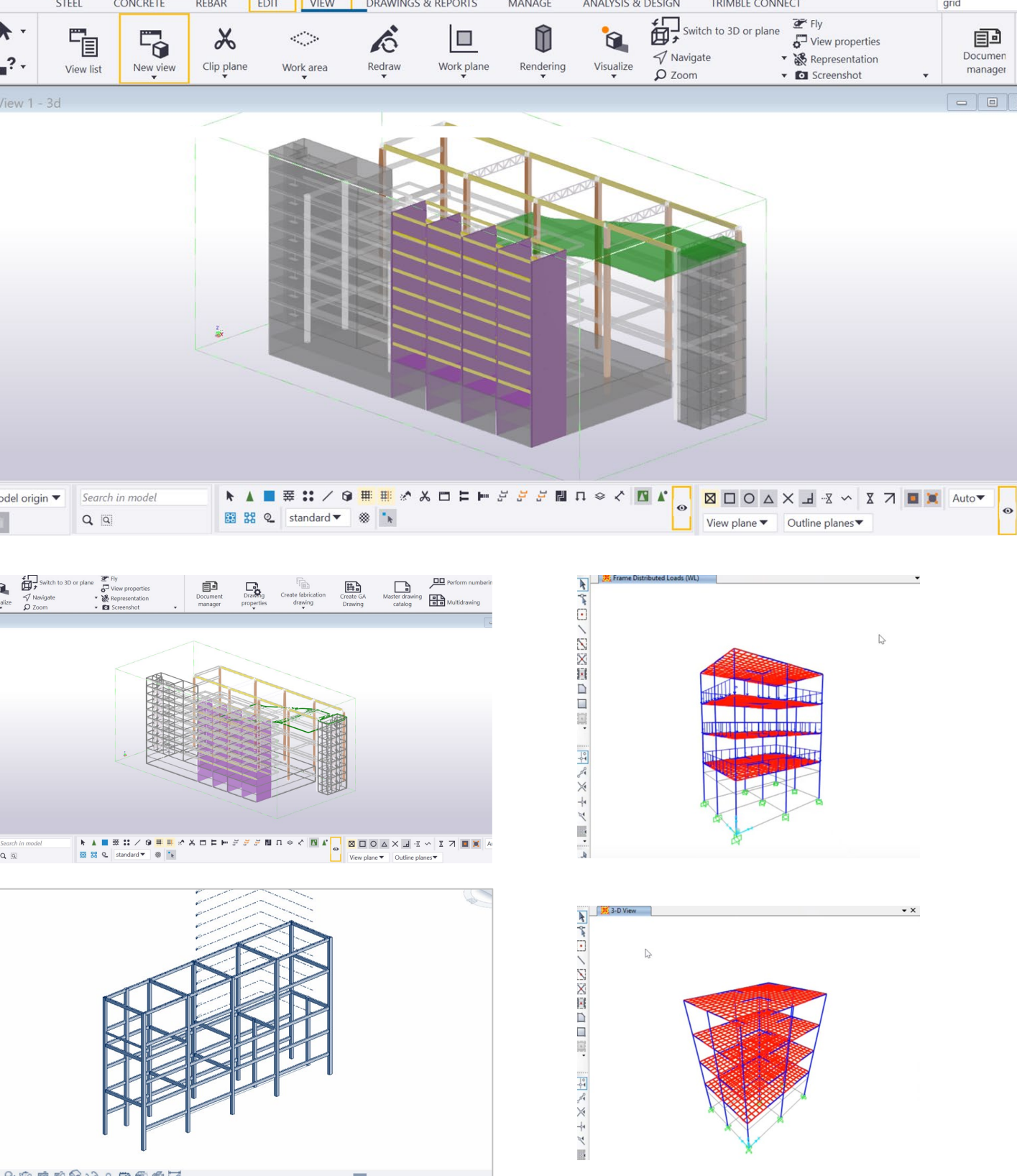
Computational Design : The use of structural analysis software to determine the structural system to apply for the proposed design and optimized the number of the columns and beams to be used. It also helps to tackle the long spanning of the outdoor covered space.
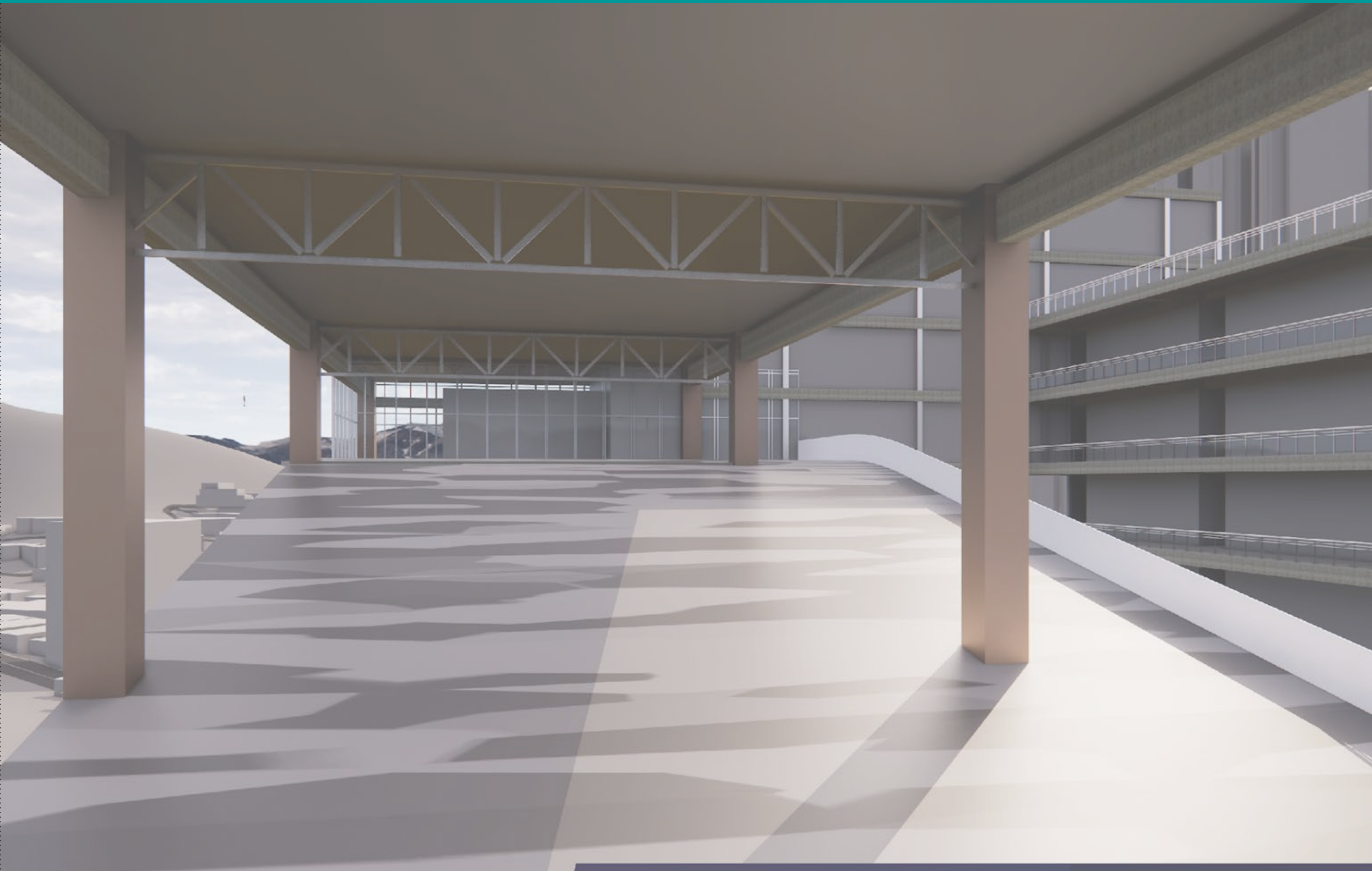
Perspective View: Please put in textual description here to describe the design of engineering elements (Structural). Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text
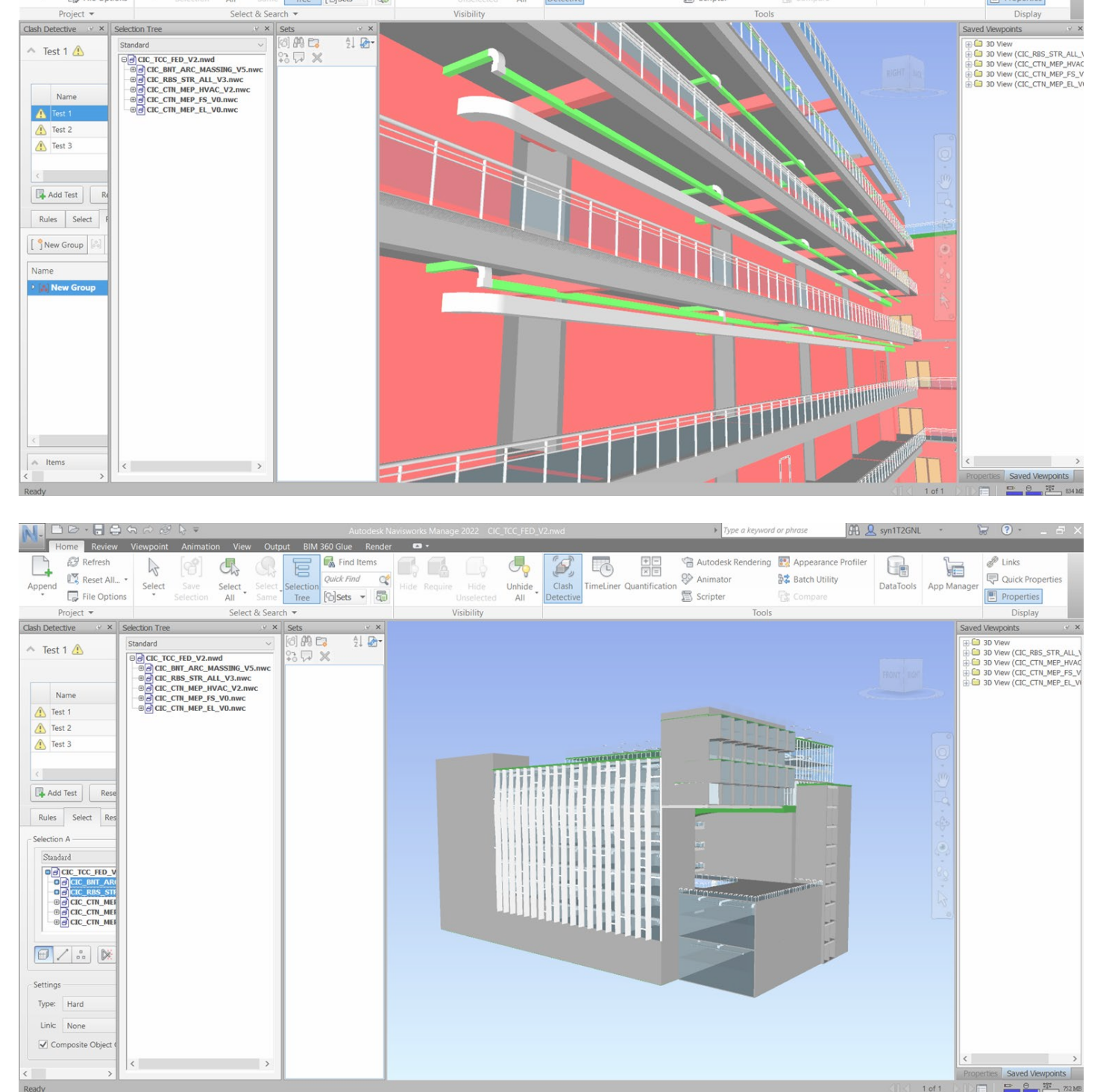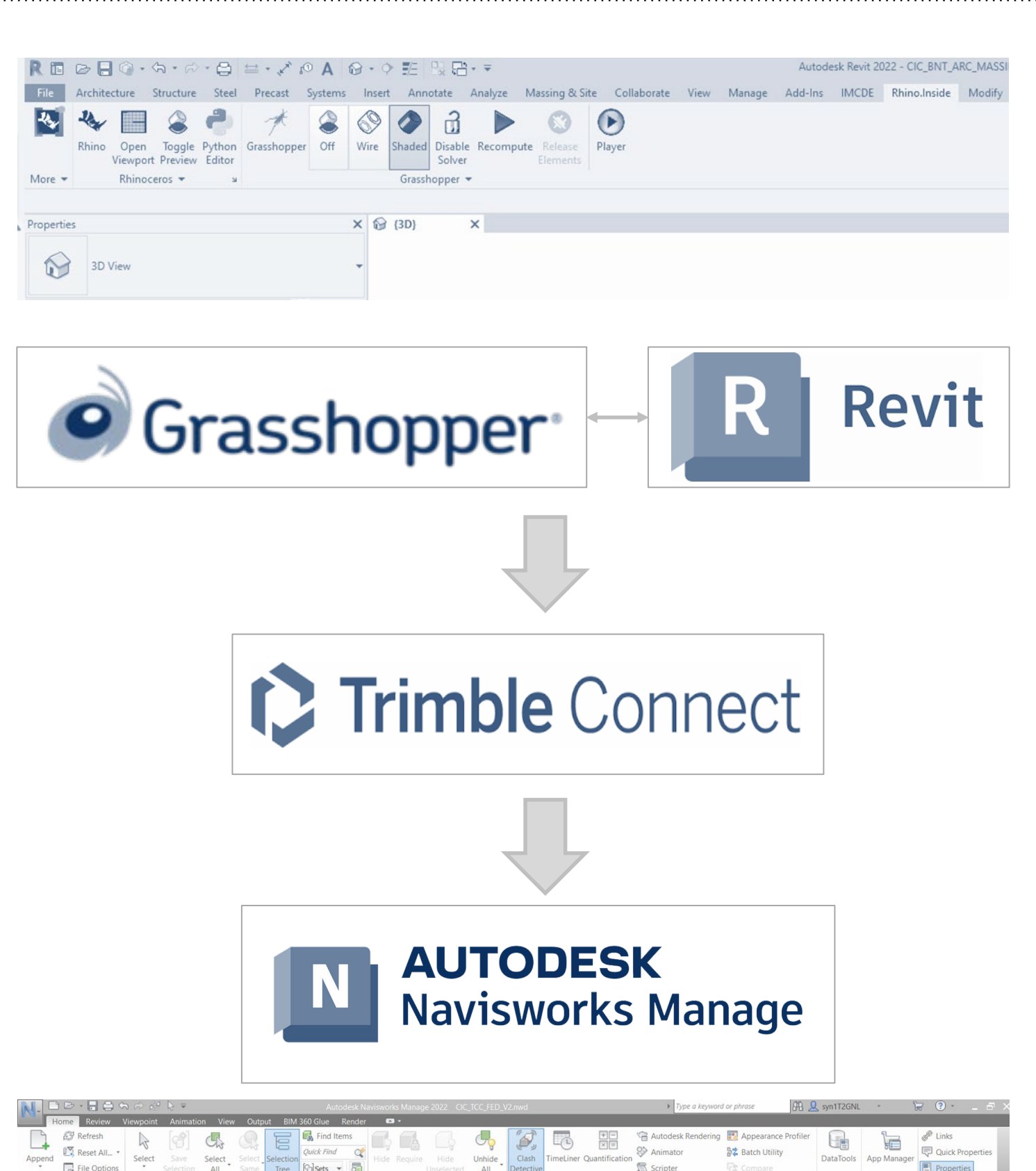
Internal Perspective 1:500

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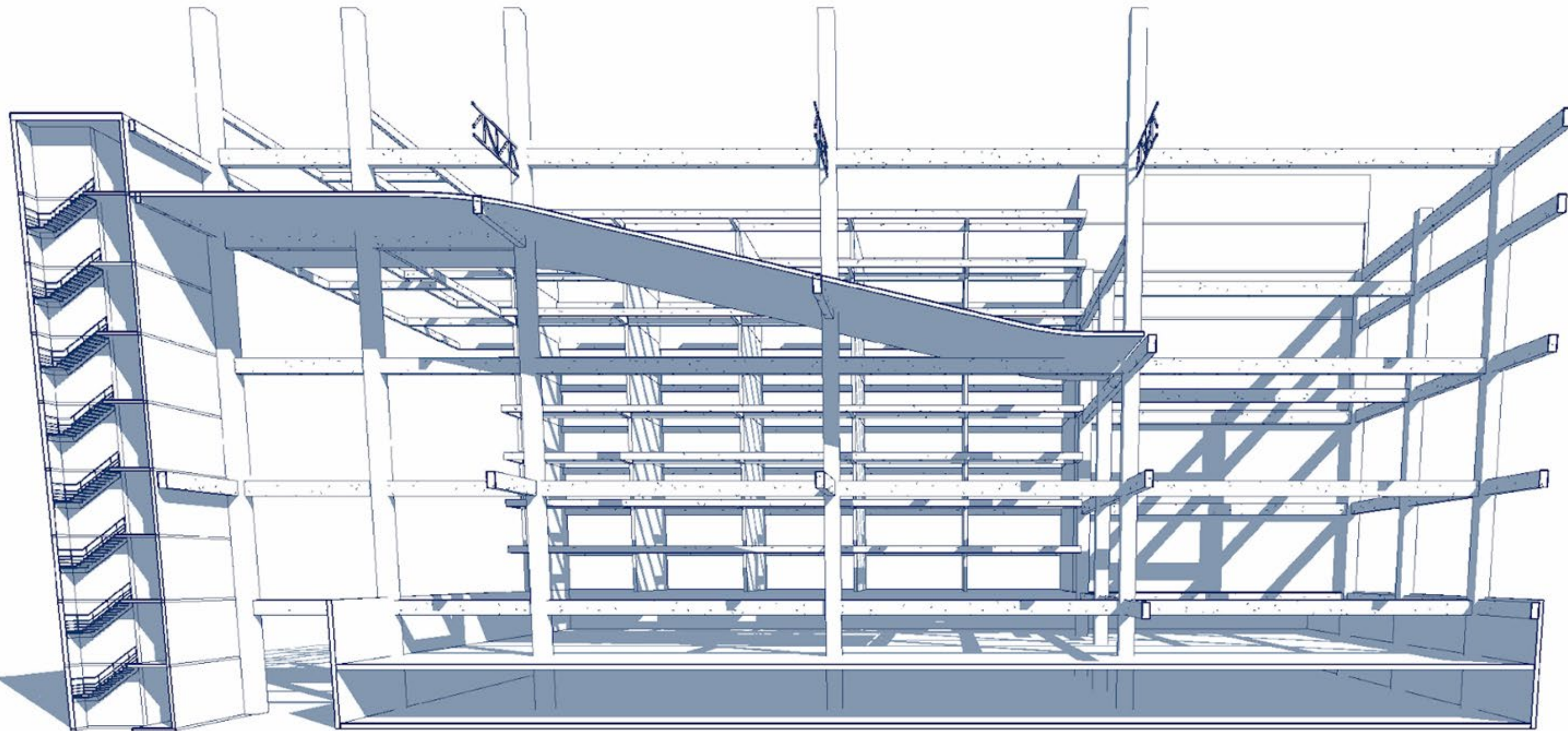
CIC BIM Competition 2023 – TEAM COSMOS

Common Data Environment

Design Coordination: Our team used Trimble Connect as the CDE platform. We structured the folders into WIP, Share and Publish to record and exchange drawings and model in different stages. The CDE also can track the state of issue which recorded and help to coordinate.
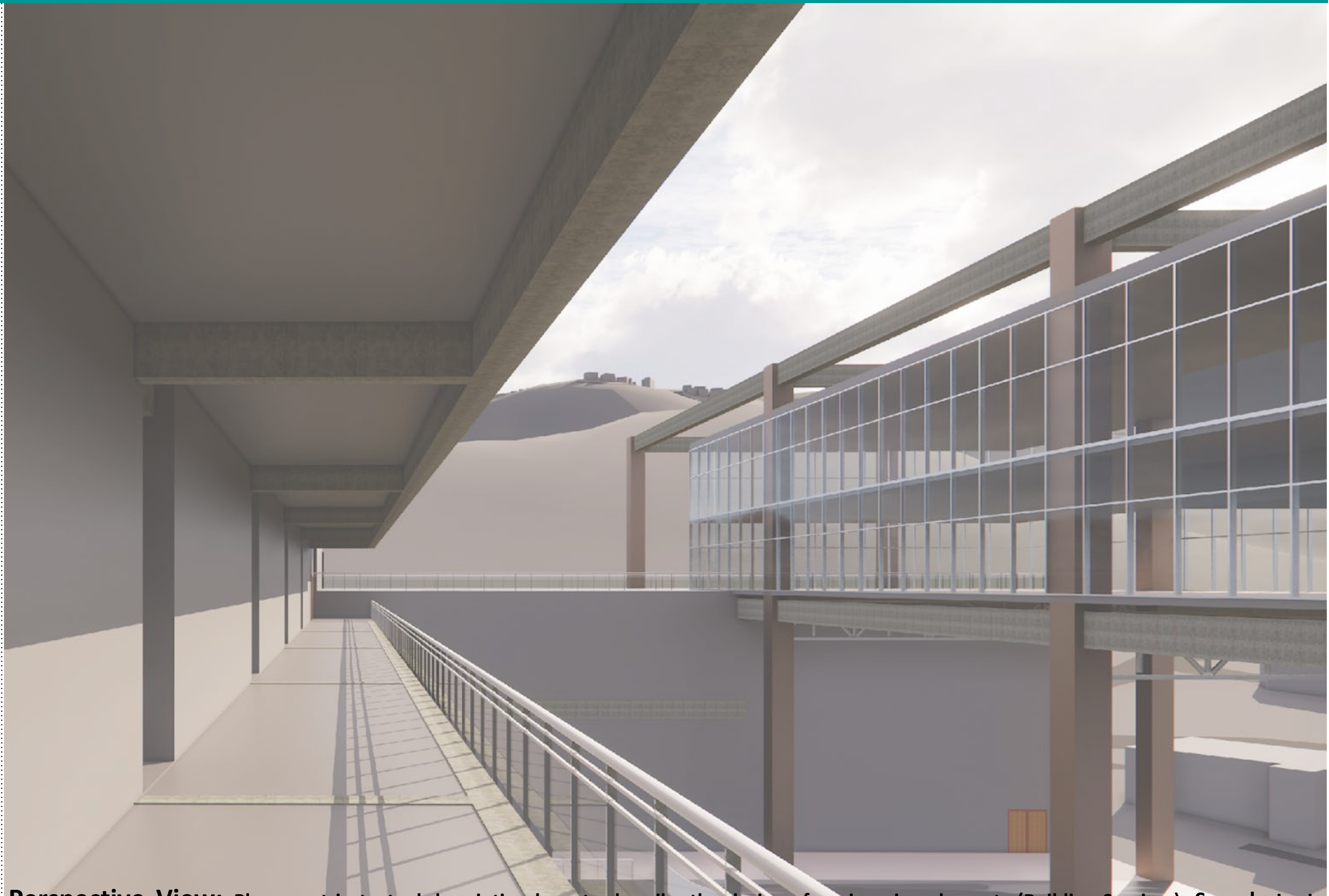

Project Team Collaboration: After generating a set of BIM models, our team uploaded the model to IM-CDE to share the model for the supervision & feedbacks. Then, Navisworks is used to carry out model federation and clash checking. Clash reports were later generated for the coordination meeting.

Perspective View: Please put in textual description here to describe the design of engineering elements (Building Services). Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample .

Internal Perspective 1:500
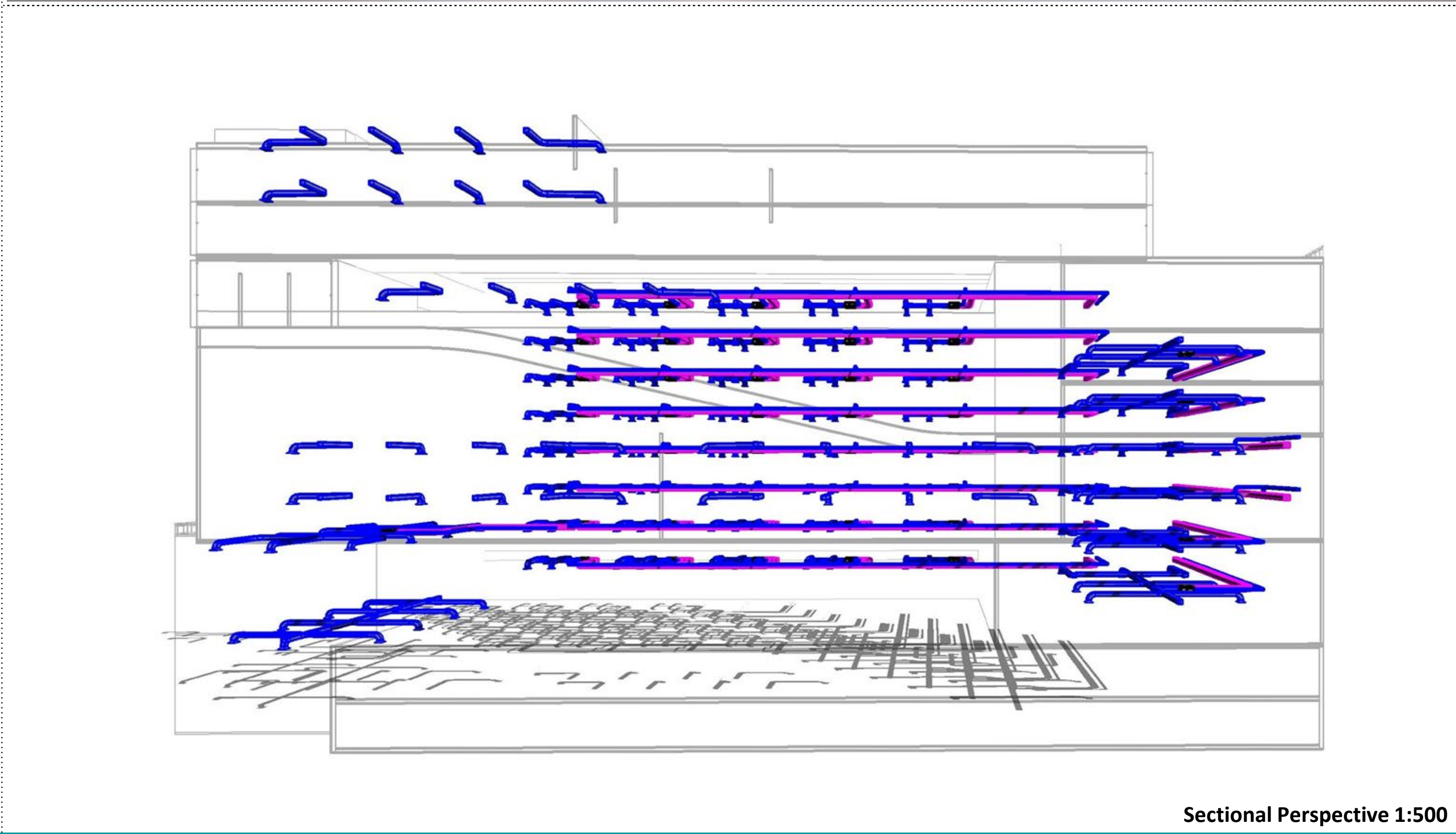
Sectional Perspective 1:500

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