ARCH. MIKOLAJ ROZEK

I am architect Mikolaj Rozek. I graduated in 2018 from the University of Technology in Cracov, Poland. I am also a programmer and web developer with fifteen years of experience. My spare time is filled with string-art sculptures and music festivals.

Since I was introduced to parametric modelling during my first year at university, I got immediately caught, and it became my passion where I could use all my skills. After graduation, this skill set gave me a chance to become a junior architect at FUKSAS studio - a renowned Italian architectural studio. I was quickly spotted as a talented architect and BIM specialist and became an architect and BIM coordinator. This experience boosted my eagerness for new technologies and their use in our architectural environment. Over the next years, I became an expert in Revit, increasing my design and technical skills, but mainly I have created an even better correlation between all my skills in my everyday use.

Now, I invite you to look at my portfolio, which shows selected projects from my architectural career, enjoy.

■COLLABORATION WITH PARALLEL DIGITAL s.r.l.

ROME - ITALY

I am collaborating with the Italian studio **Parallel Digital**. It is a sister company to **It's Vision**. Together offering high-quality architectural services, from concept design to the realization of the project, all inside the BIM environment. My responsibilities are BIM management, Innovation Research, Architect, and IT administration.

■ MOZUKAI - BORDEAUX, FRANCE

- TYPE: **PUBLIC/OFFICE BUILDING**
- AREA: **15000m²**
- PHASE: **SCHEMATIC DESIGN / CONSTRUCTION DOCUMENTS**
- LOD: **300**
- LOI: **200**
- POSITION: **BIM MANAGER / ARCHITECT**

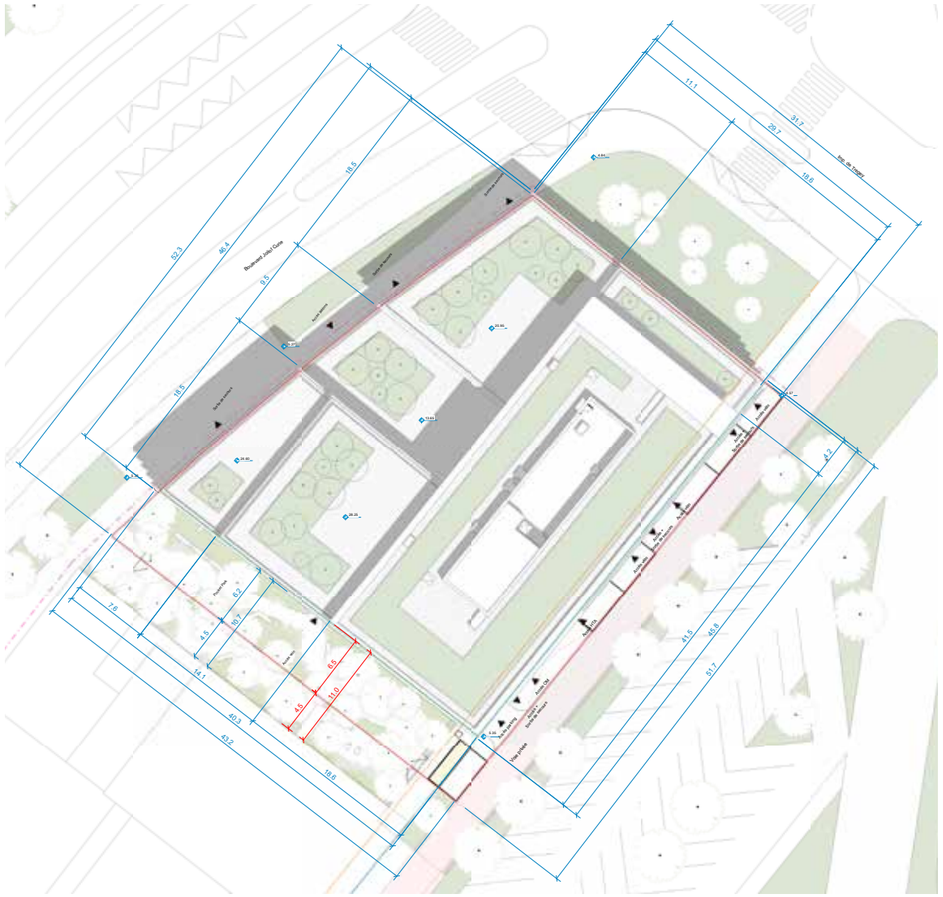
The **MOKUZAI** project was my first project when I joined the studio. My responsibilities included coordinating the project in Revit with French subcontractors. Also, I could show my architectural and problem-solving skills. After initial success, I became fully involved in the design of the building.

The best solution for the building facade required an equilibrium between cost-effectiveness and French legislation requirements for sustainable design. This took about 50 variations of all elevation designs in Dynamo script. Additionally, I took responsibility for finalising the design of the structure of the building cooperating with the studio in Bordeaux. I was finding the best solutions to keep the design in the best shape and fulfil the needs of the structure. At the final stage I was creating detailed drawings and views, but thanks to my management, the process was smooth and we finished the project at the deadline.

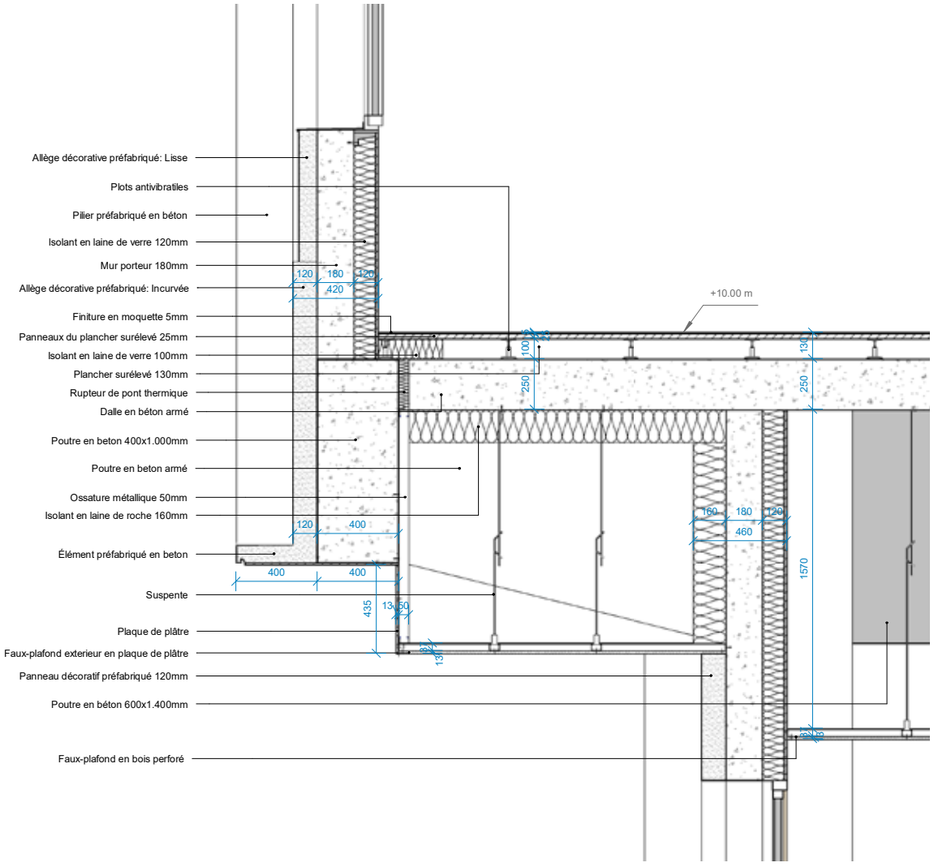
RESPONSIBILITIES: Solving technical problems; Creating detailed drawings; Creating advanced dynamo scripts; Controlling the quality of modelling and families; BIM Coordination; designing advanced families, solving software and hardware problems, coordinating the project with a studio in Bordeaux; Creating Dynamo player scripts for studio-wide use;

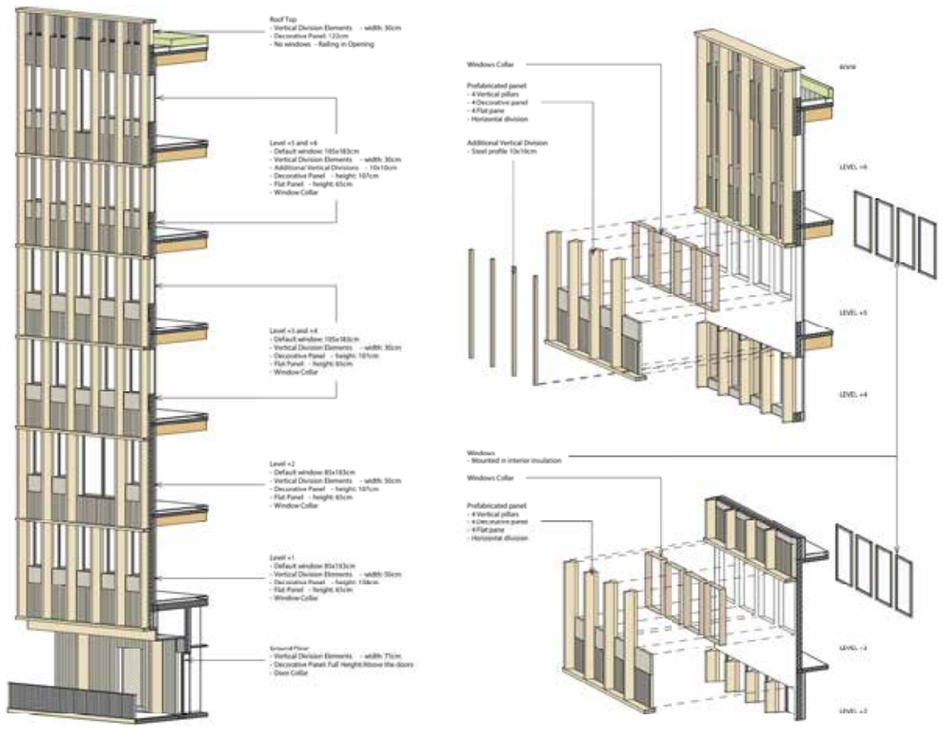
At first, the Revit model was used for 3D rendering. Next, I introduced VR technology in the studio, also have been inserted into virtual reality. Everybody could visit a realistic and 1:1 scale building that the construction hasn't even started.

Another use of the model was 3D printing. I have prepared part of the elevation with the elements we wanted to analyse. For 3D printing, I have to clean the model from unnecessary and too small to print elements, ensuring the stability of the printed model. After the first, the effect was perfect.

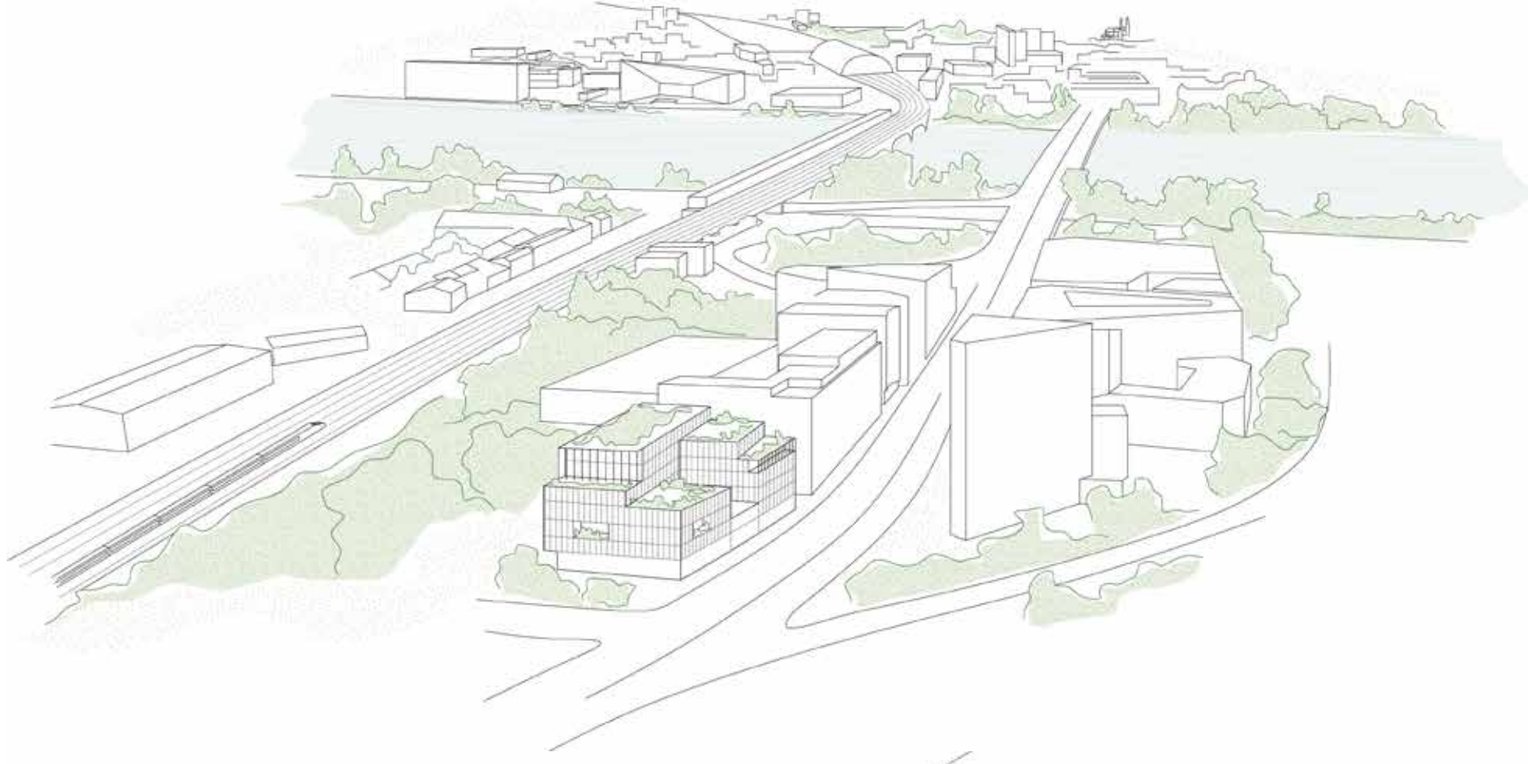


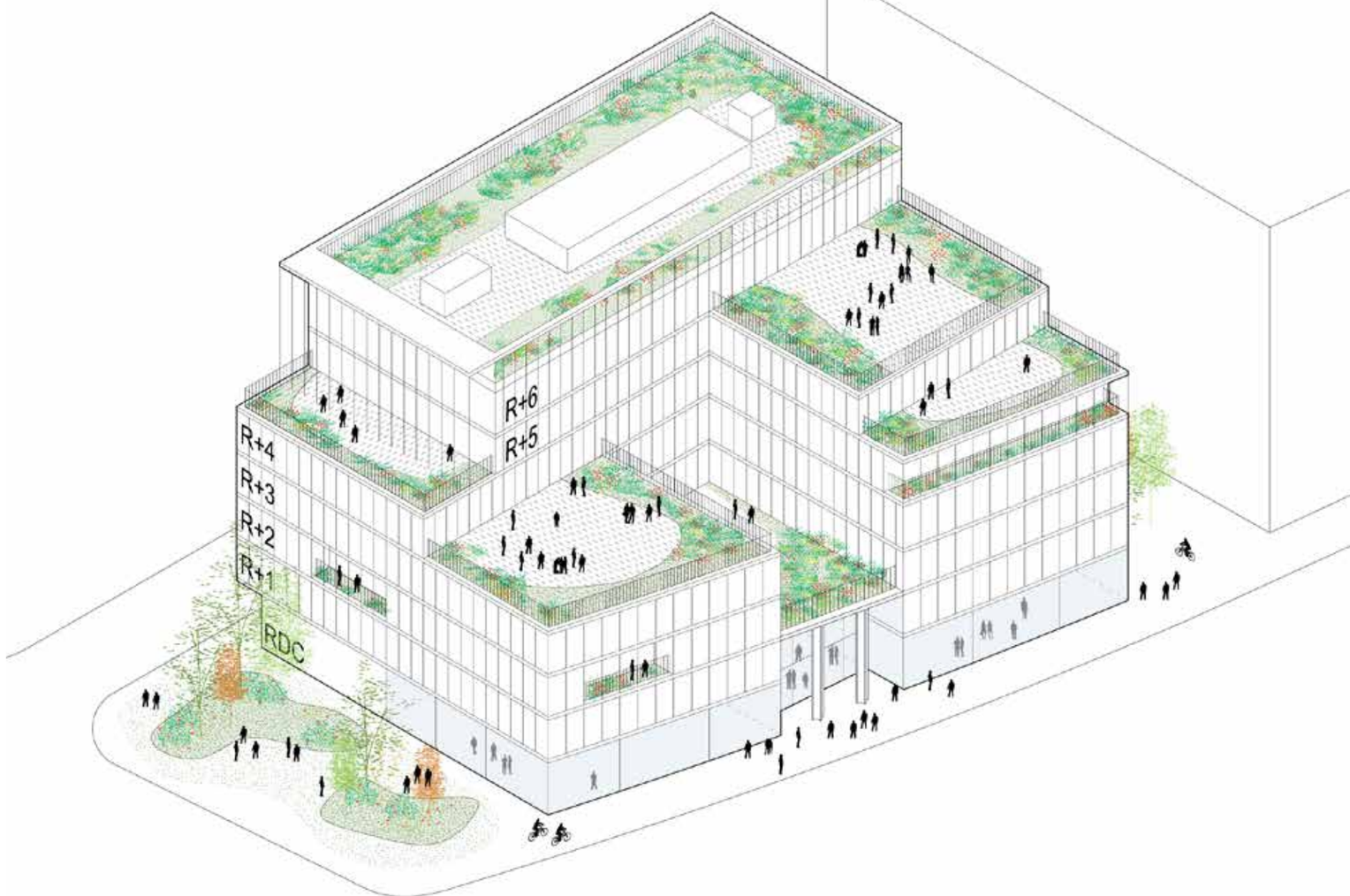
Plan view - Master plan of the building





Scheme - prefabrication of the element for construction fasade of the building.



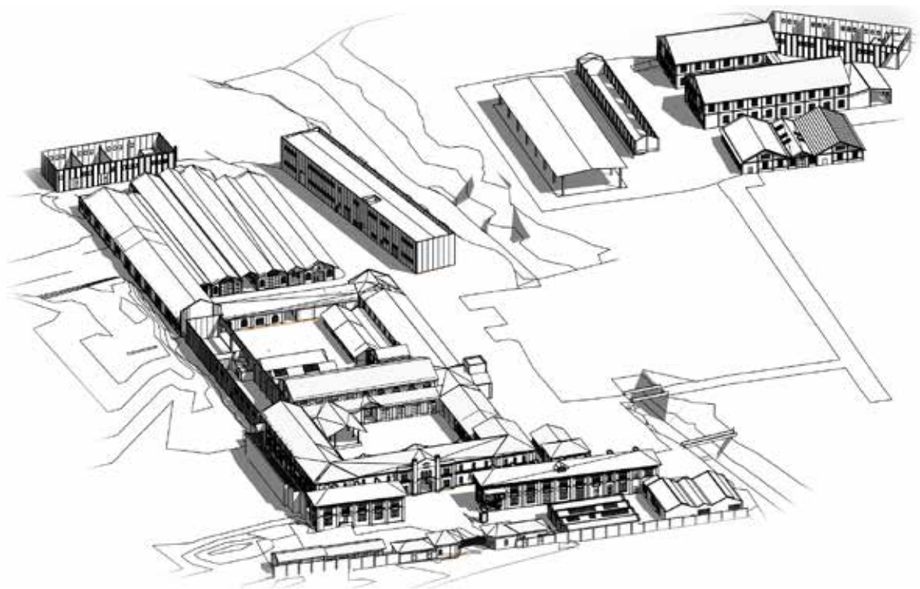


ARSENAL - PAVIA, ITALY

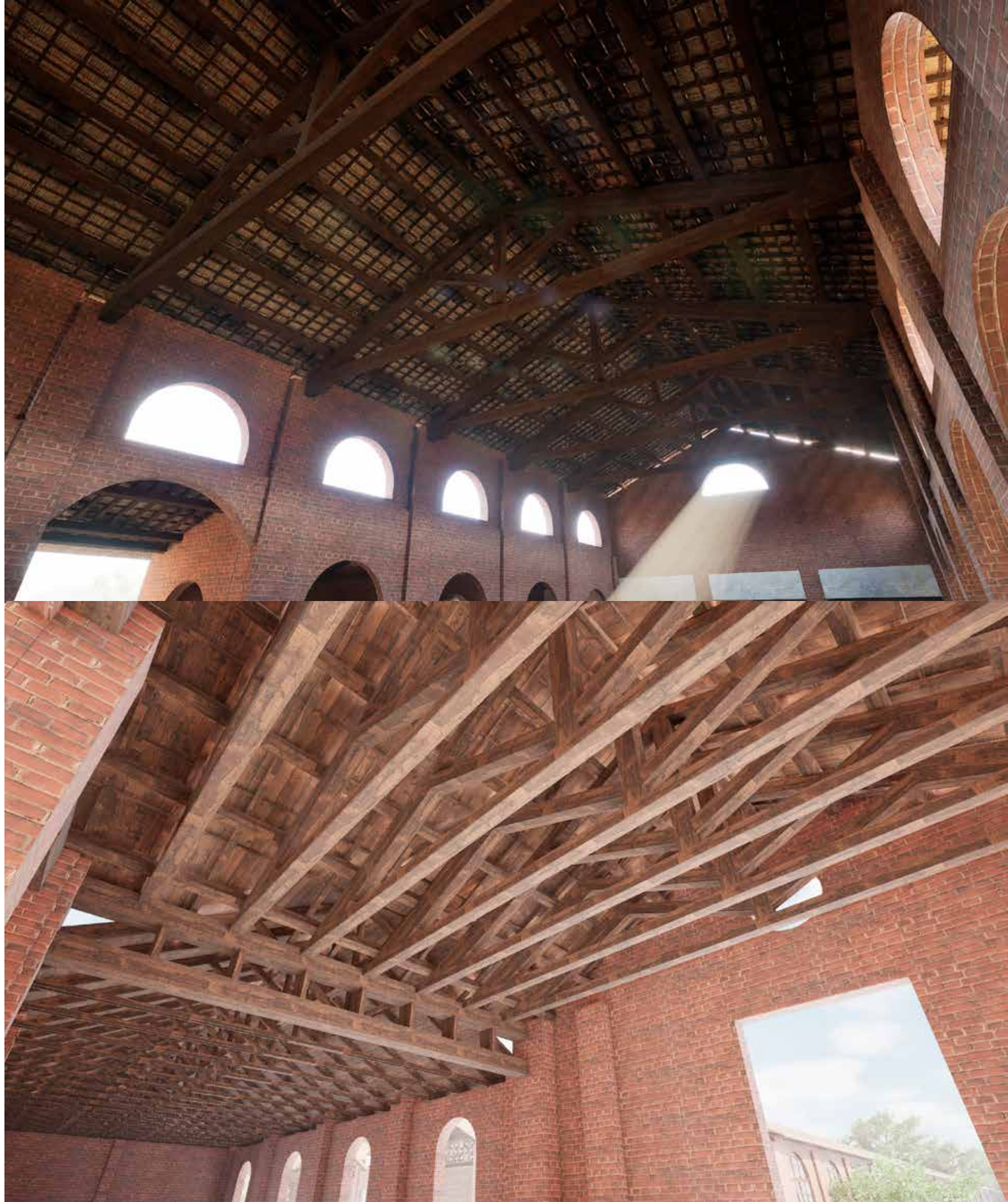
- TYPE: **MILITARY / WAREHOUSES**
- AREA: **140 000m²**
- PHASE: **LASER SCAN TO BIM**
- LOD: **300**
- LOI: **300**
- NUMBER OF BUILDINGS: **22**
- SCOPE OF CONTRACT: **ARC / STR / MEP**
- POSITION: **BIM MANAGER / ARCHITECT**

The project of Pavia was acquired by public tender. We have planned the whole process for 4 months of work by a team of 6 people. We have created up to 70 files, hundreds of families, details, sheets, etc. The contract includes all disciplines visible on laser scans, which means we have to create elements for all architectural, structural, HVAC, piping, electrical, and firefighter elements. I was responsible for understanding all the systems and parts. My tasks also included helping the team to define logical and working models. The challenging task was inserting millions of parameters into all parts, and validating them, so I decided to automate all tasks. I created a dynamo script for recognition and filling information, and then Model Checker was set up with more than a thousand checks to validate the models.

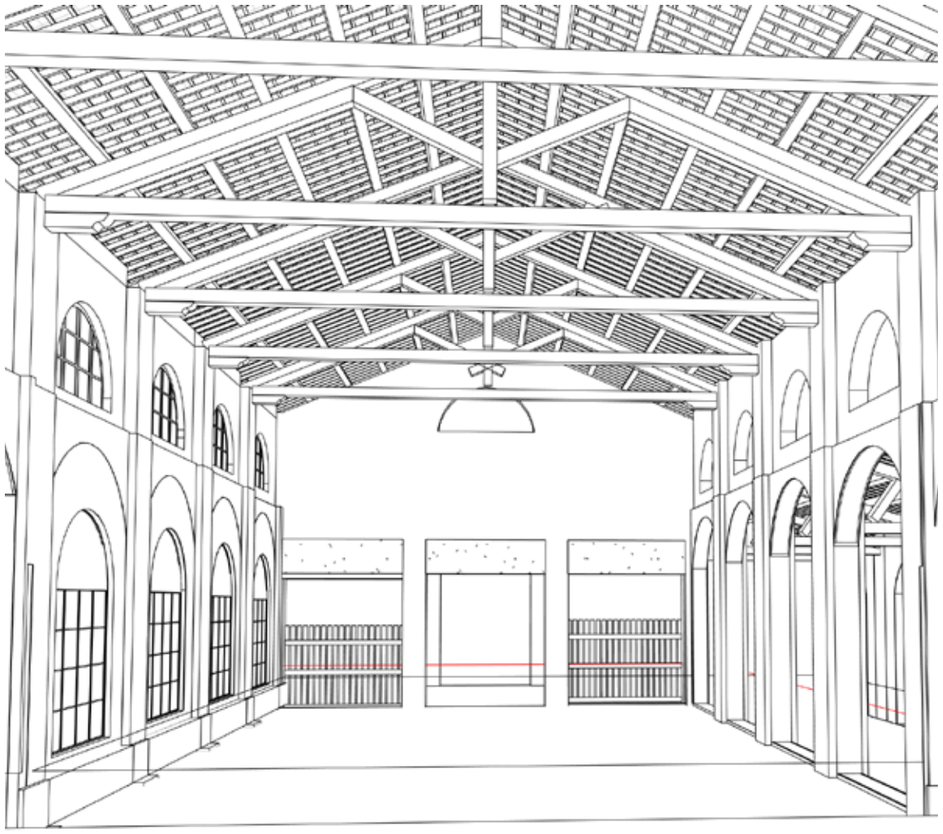
I administered this project with my BIM manager partner. The client expressed his gratitude towards our input on the project. This was one of the proudest moments of my professional life.



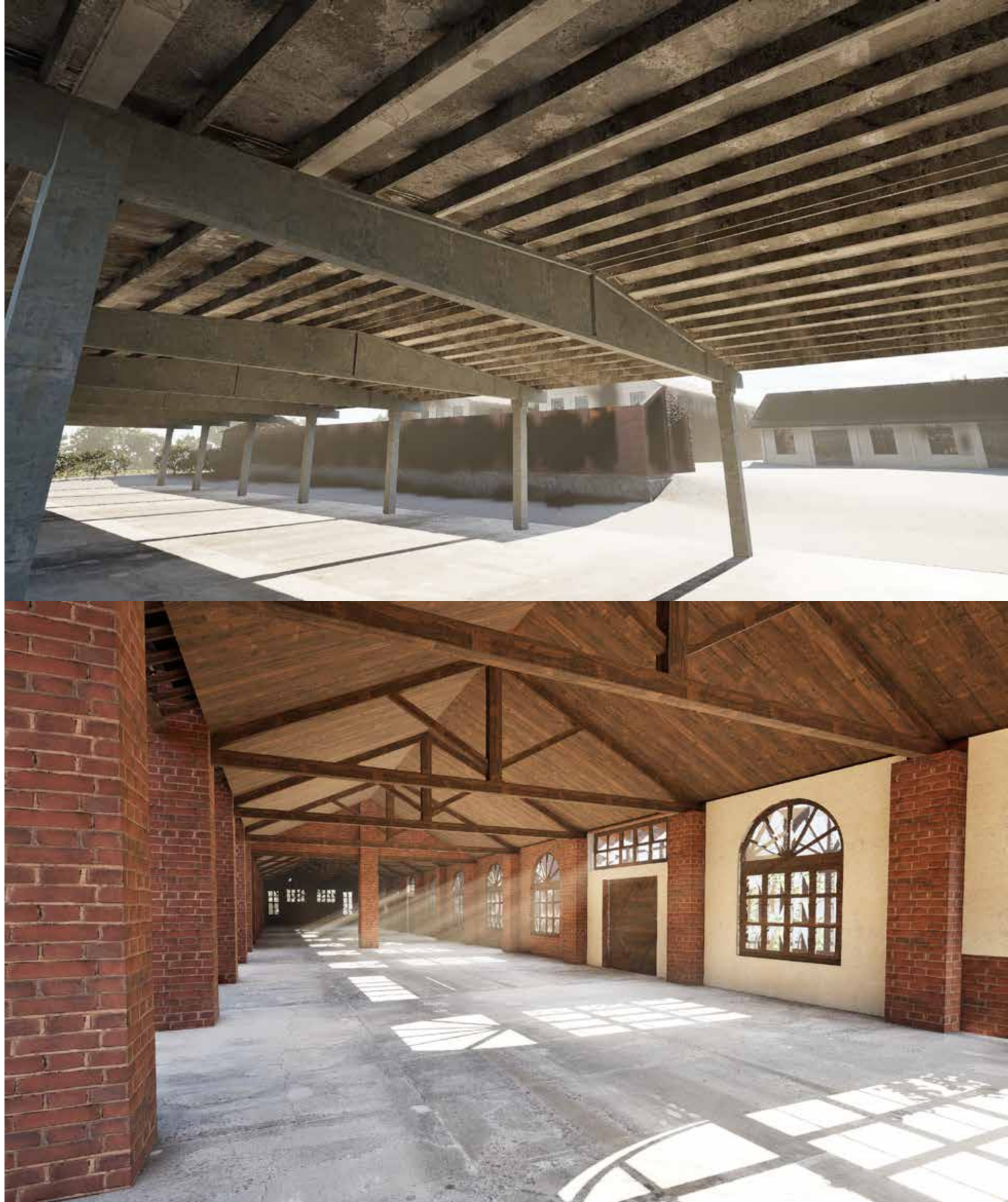
Bird view - plan of the building



I introduce new and innovative solutions in our firm. The VR technology allowed us to do better reviews of the models and ease of finding errors. The software used for this was Unreal Engine 5 which gives a realistic real-time environment for our models. All 22 buildings with their structure were merged into one virtual realm. Also, we created materials for media promotion, like animations, or renders. There is also the possibility to export projects for the client and run a VR presentation on any VR setup.

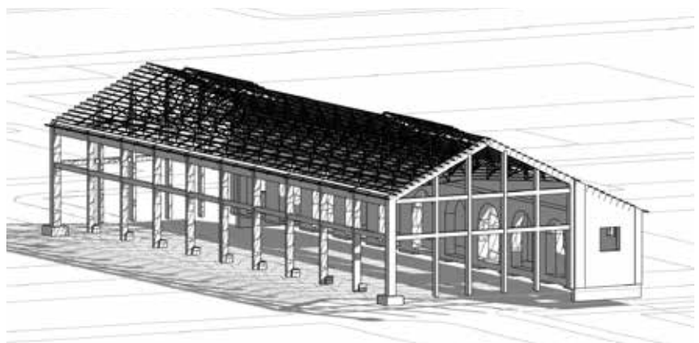


Digital twin - interior view with visible structure



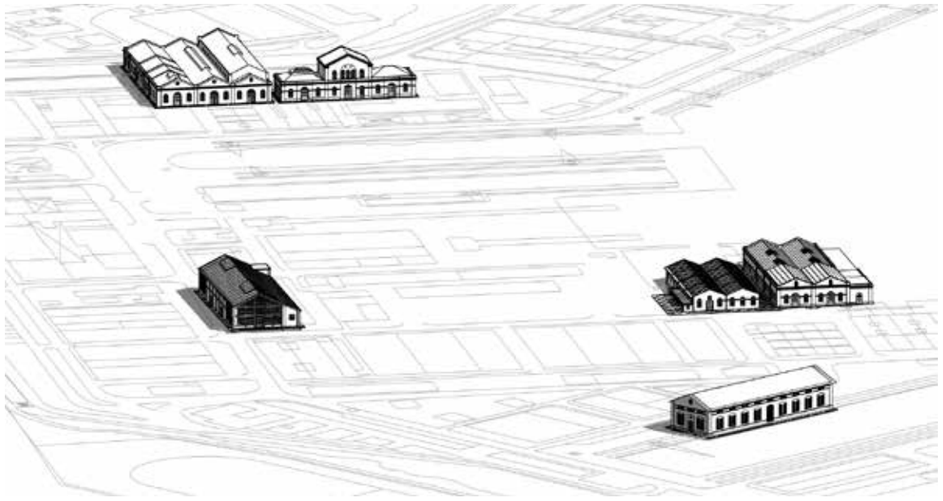
SHIPYARD - TARANTO, ITALY

- TYPE: **SHIPYARD / WAREHOUSE**
- AREA: **40 000m²**
- PHASE: **LASER SCAN TO BIM**
- LOD: **300**
- LOI: **300**
- NUMBER OF BUILDINGS: **6**
- POSITION: **BIM MANAGER / ARCHITECT**

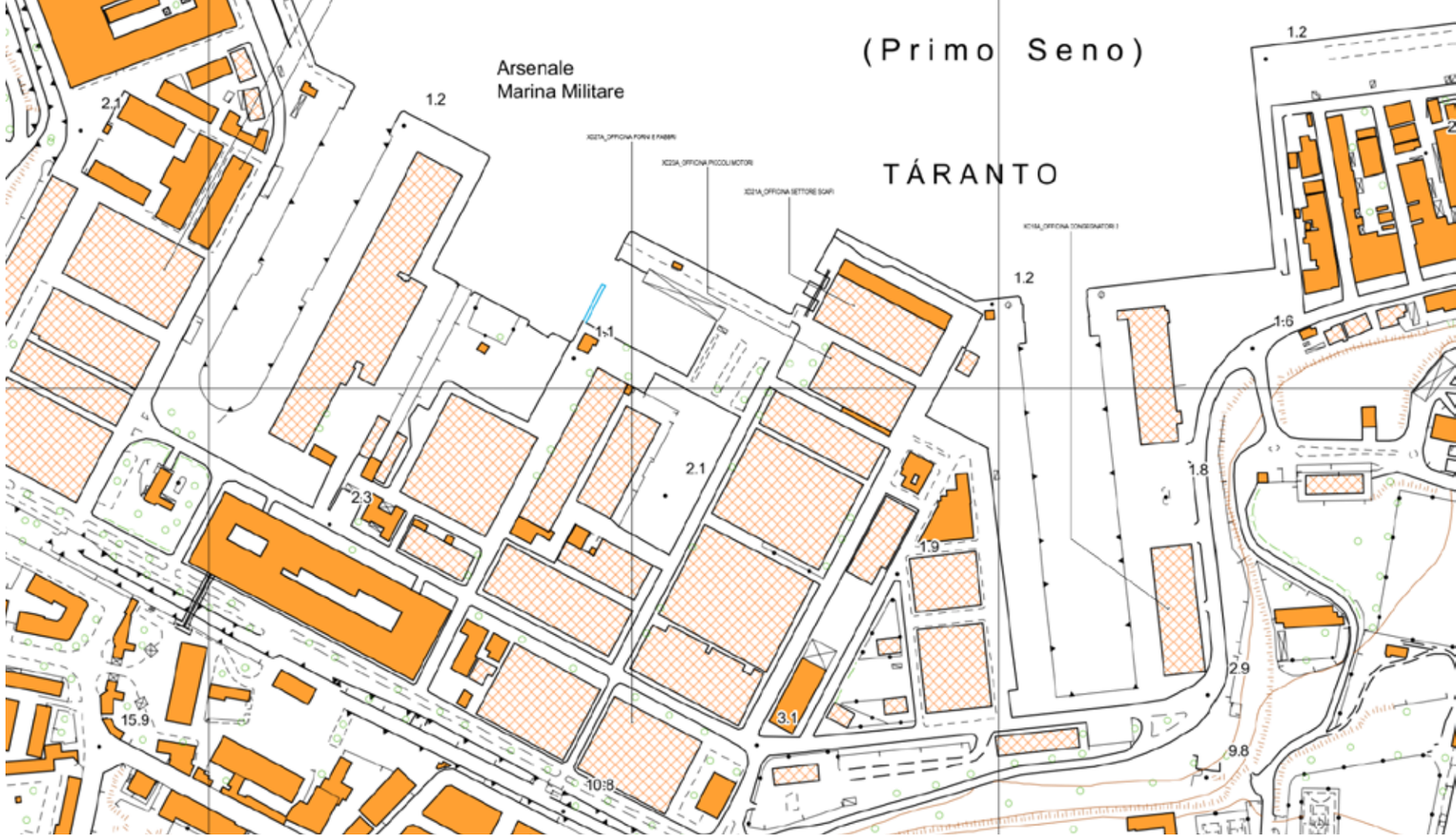


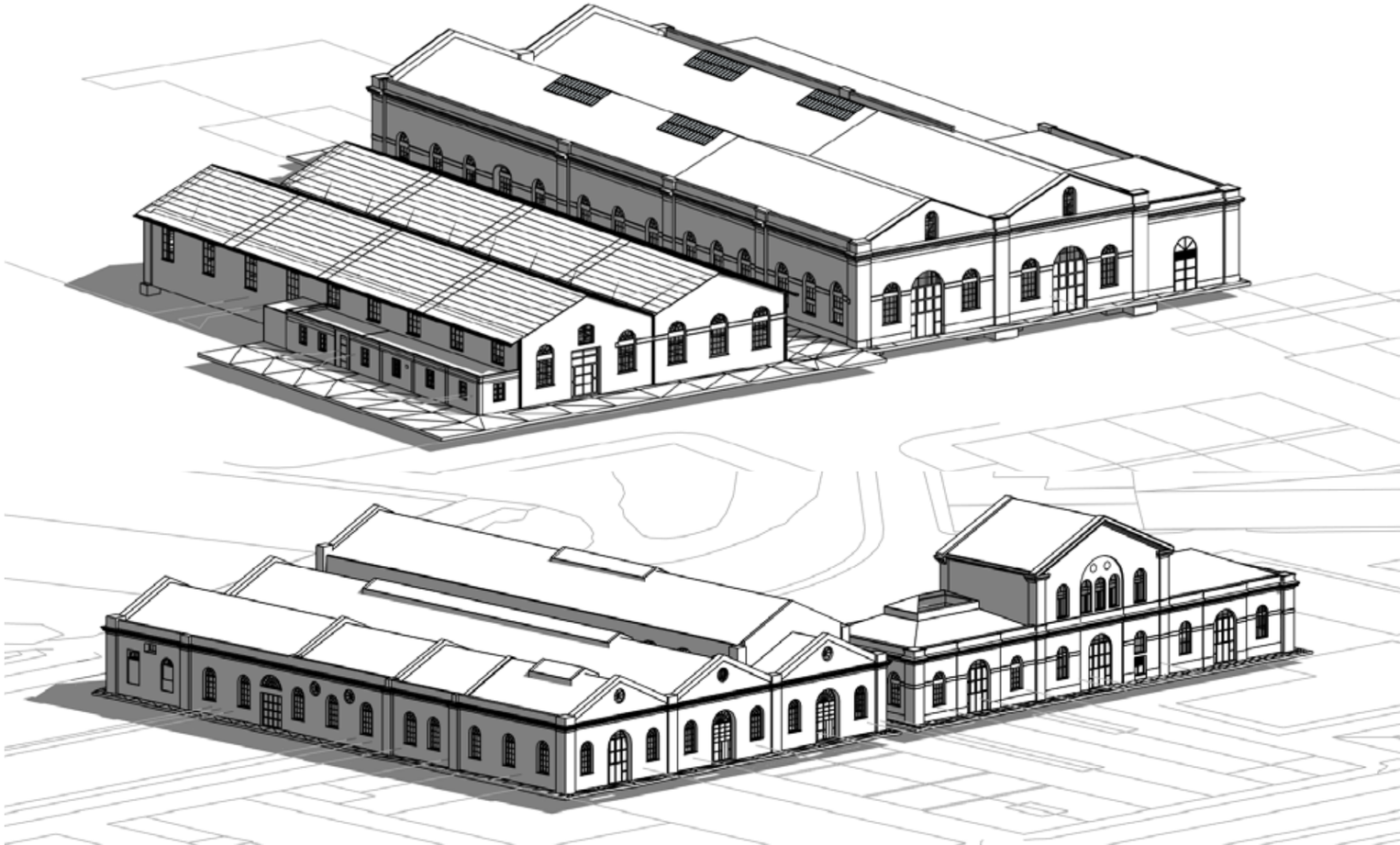
View of the structure

The project of the Shipyard in Taranto was also acquired by public tender. The contract includes all visible disciplines on laser scans, which means we needed to create elements for all architectural, structural, HVAC, piping, electrical, and firefighter parts. I was responsible for understanding all the systems and parts and helping the team to define the logical and working models. The next step will include designing public spaces (museums, exhibition spaces, etc).



Bird view - plan view





COLLABORATION WITH FUKSAS STUDIO

ROME - ITALY

I was collaborating with Fuksas studio as an architect and BIM Expert. In Dynamo I was solving any design and model problems of complex shapes of the head architect. I was also an IT solution advisor for the studio.

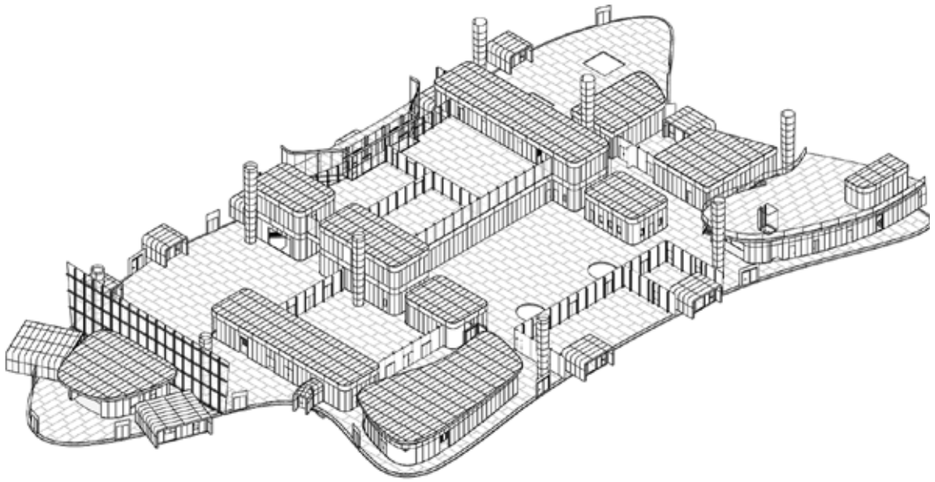
GELENDZHIK AIRPORT - RUSSIA

- TYPE: **AIRPORT**
- AREA: **9192.57m²**
- PHASE: **CONSTRUCTION DOCUMENTS**
- LOD: **300**
- LOI: **350**
- POSITION: **BIM COORDINATOR / ARCHITECT**

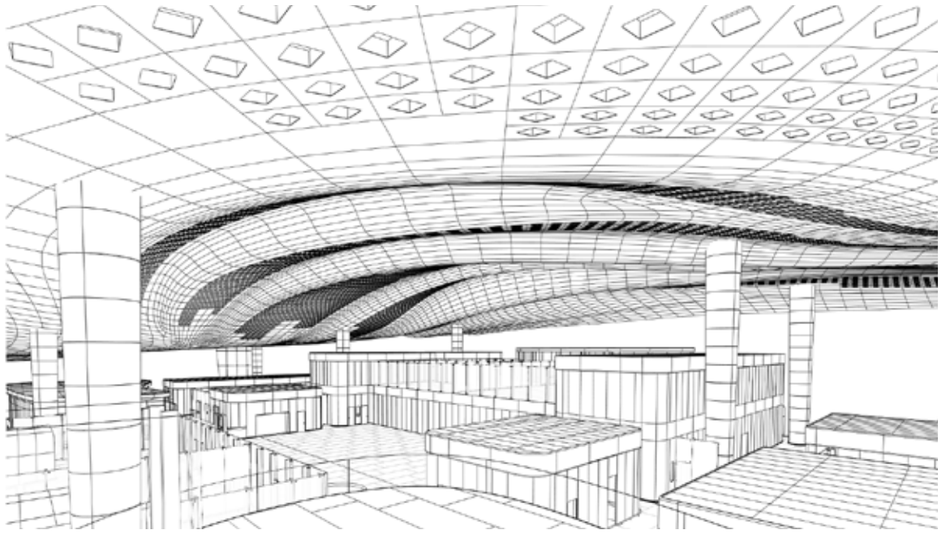
The project of Gelendzhik Airport in Russia - includes general shape, master plan, and project of interior design. Mass of the building is very sculptural, the surface of interior main ceiling was inspired by flag blown by the wind, which gave ceiling very artistic, yet complex shape. The facade of the airport is based on an irregular curve giving dynamic effect. Internal functions are distributed in box modules, which are clad by aluminum panels, some of them with custom cut patterns. In between them, you can find custom shaped boxes, which are representing significant functions of the plan. In the end, the project contains around 4000 custom panels and around 8000 panels inserted based on data from Rhino, everything achieved by dynamo scripts.

RESPONSIBILITIES: Solving technical problems; Creating complex custom paneling for internal finishing surfaces (Dynamo or advanced Families - LOD 300); Design advanced ceiling substructure using Dynamo; Managing project information according to BEP (using Dynamo were suitable); Controlling the quality of modeling and families; Assisting BIM Coordinator in planing: workflow, designing families, solving software and hardware problems, coordinating the project with Russian studio;

One of the biggest challenges was to design the structure for the airport ceiling. It required a perfect fitting between the position of panels and the main structure which was designed separately in Russian studio. I have designed Dynamo script that calculated the whole substructure according to the permanent position of based elements, with intelligent collision checking, which ware adjusting structure avoiding intersections with panels or structural frame.

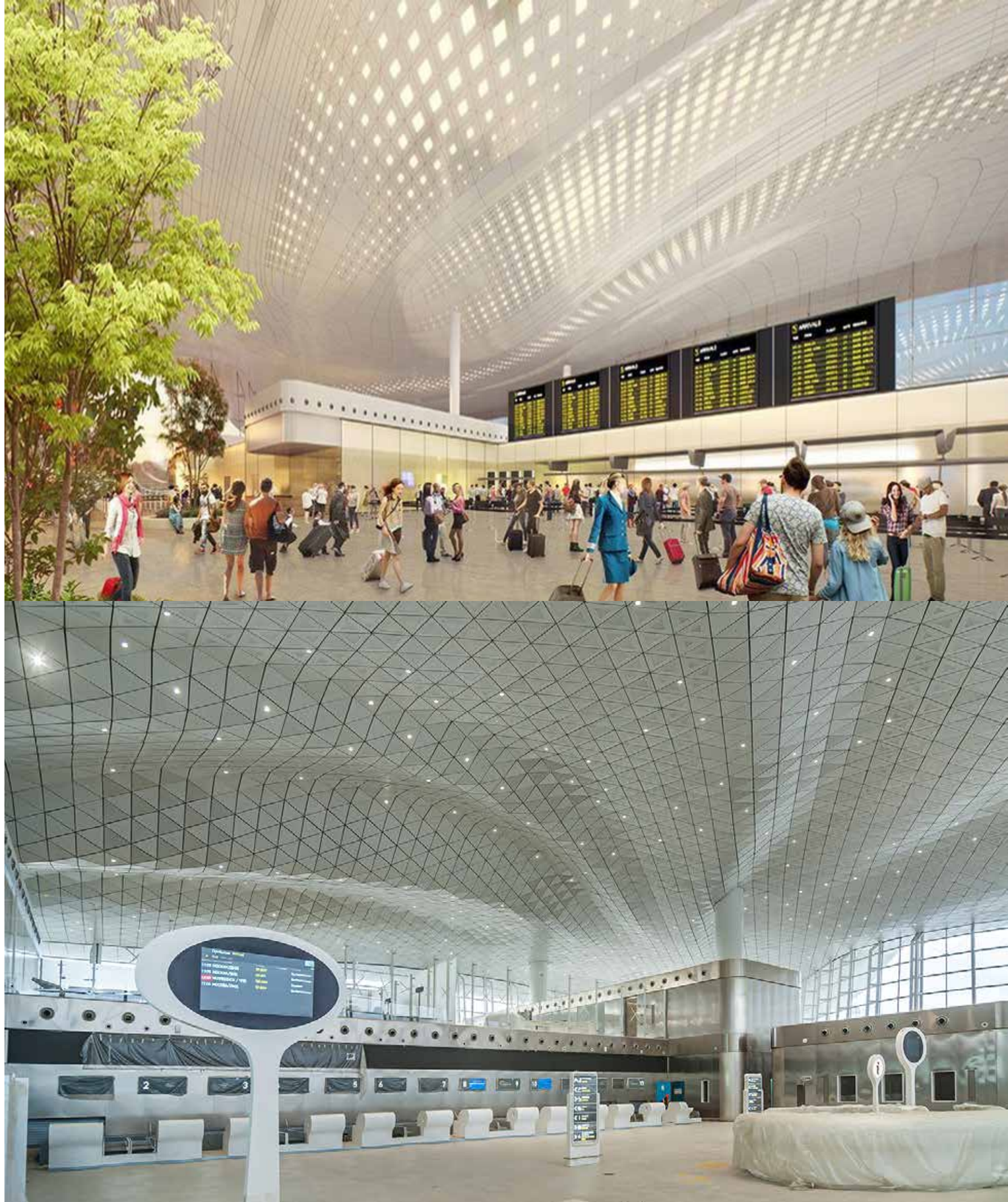


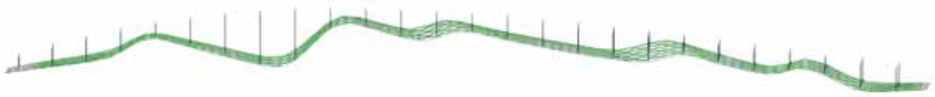
Scope of the project (without ceiling)



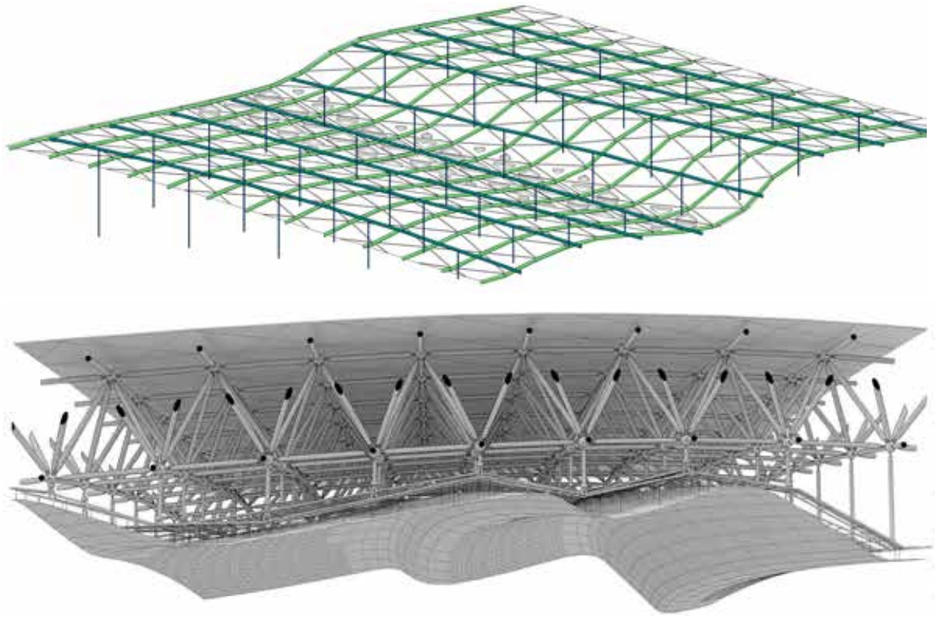
View of the designed ceiling

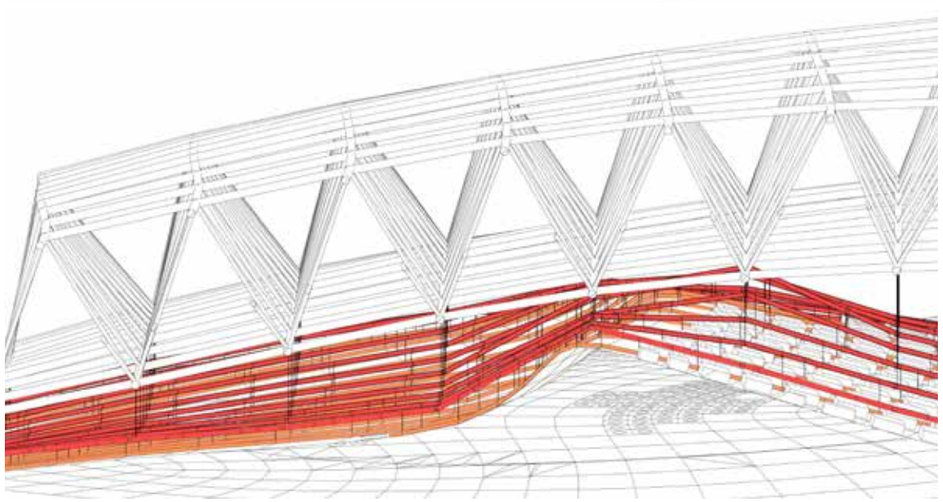
Elevation view



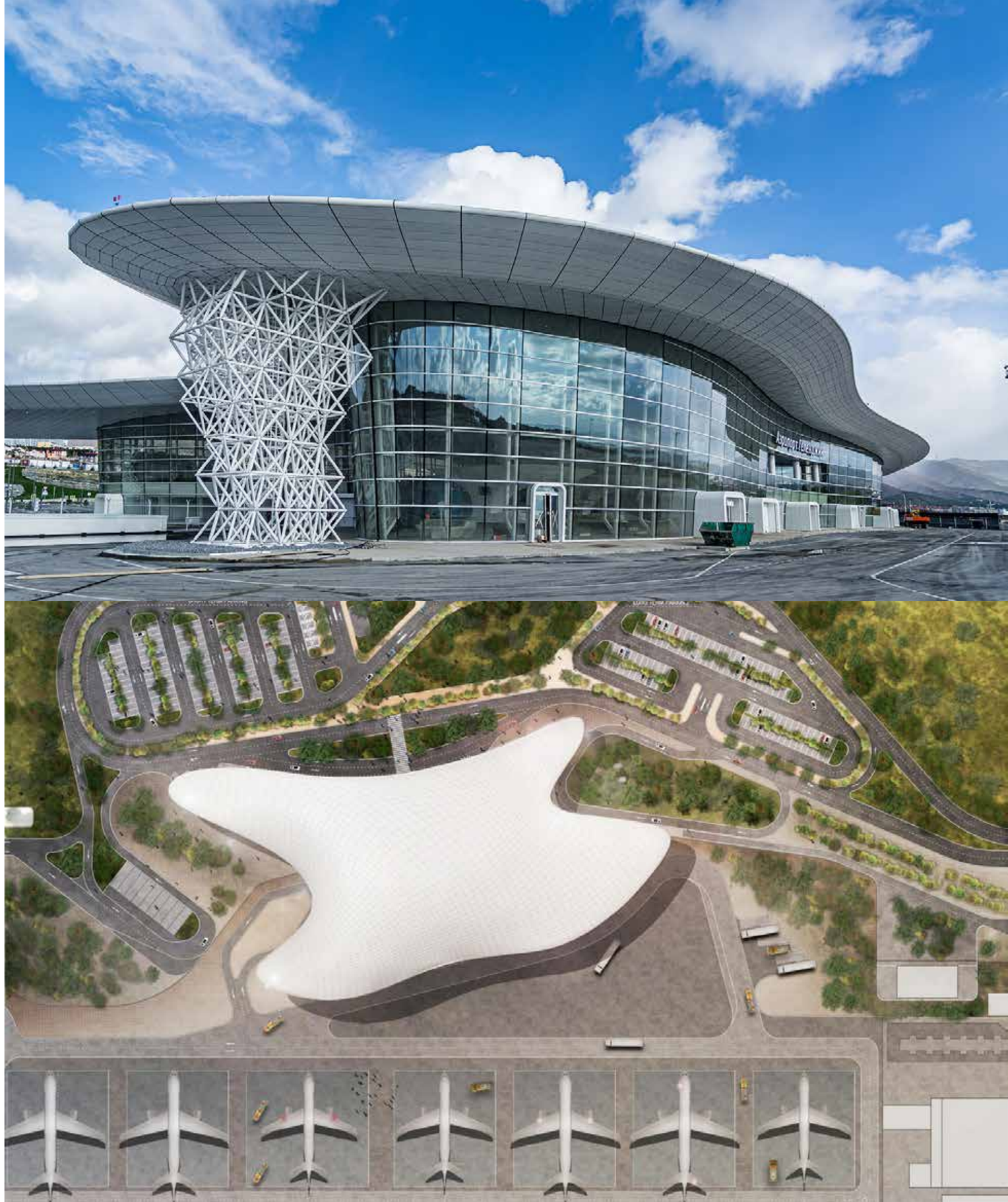


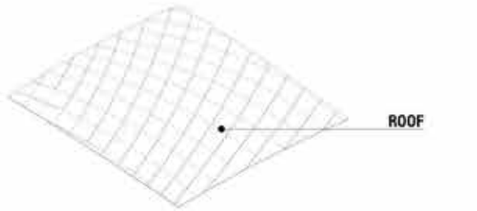
Examle of sections which were used to distribute sprinkler system acros whole ceiling (Dynamo).

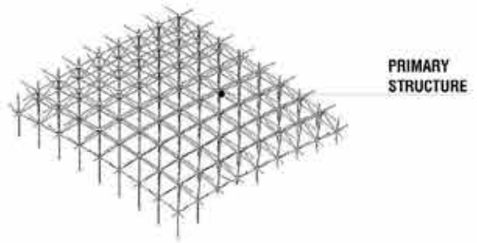




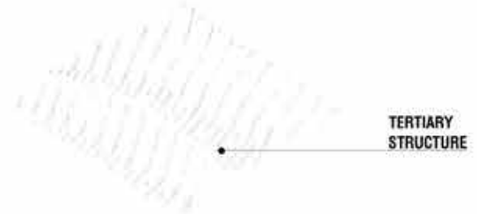
Generated secondary, terciary structure, and suspenders.

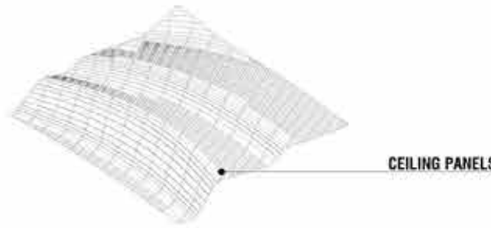


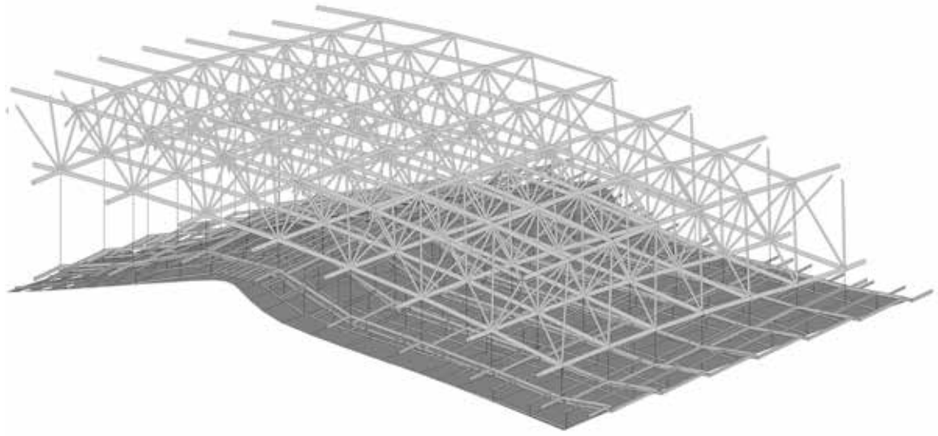

ROOF


PRIMARY
STRUCTURE

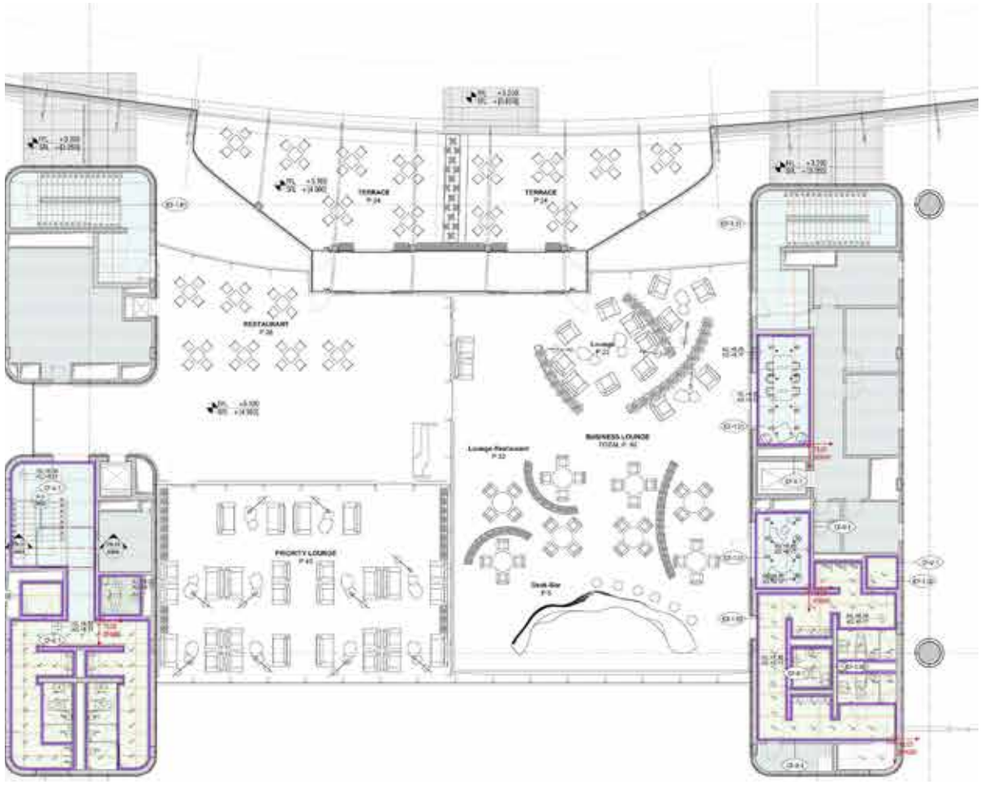

SECONDARY
STRUCTURE

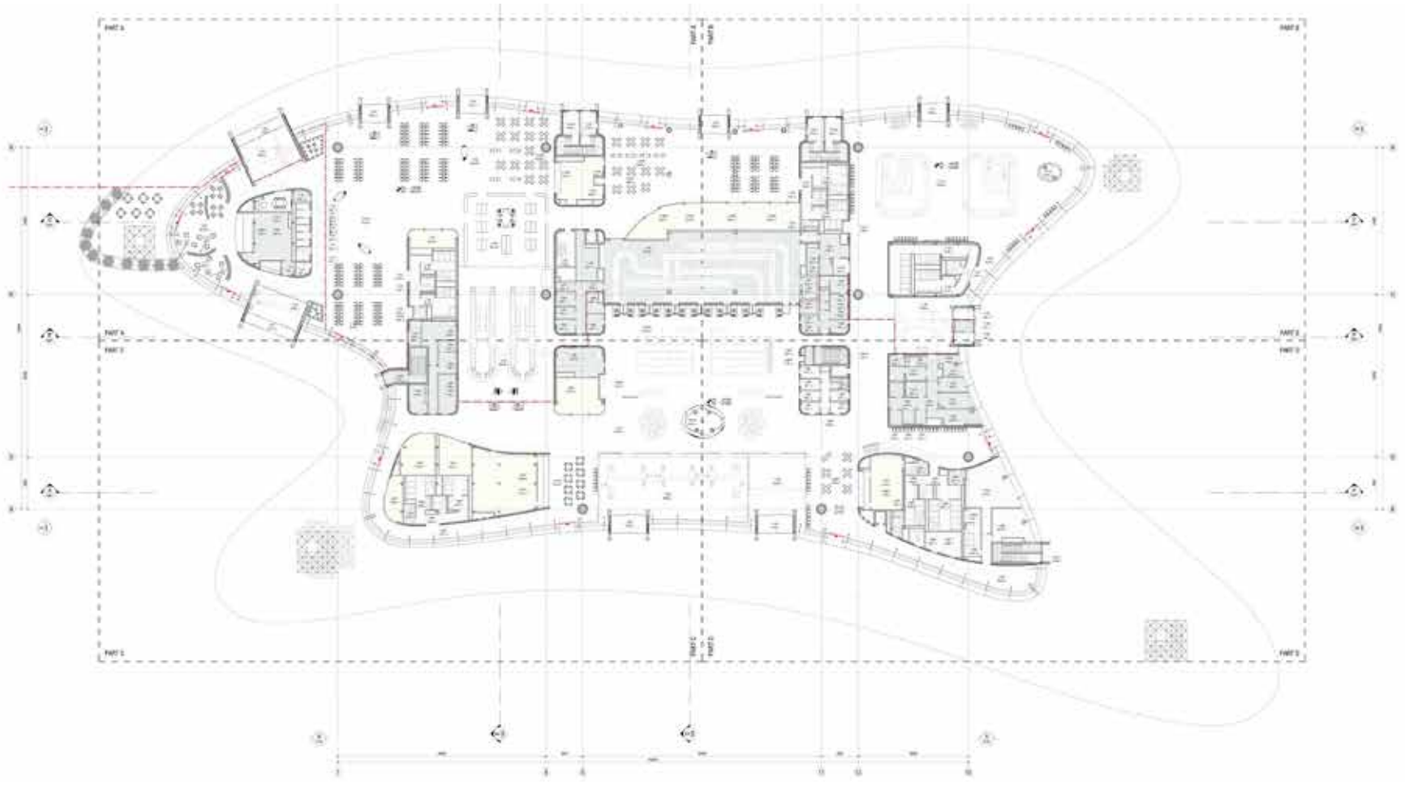

TERTIARY
STRUCTURE

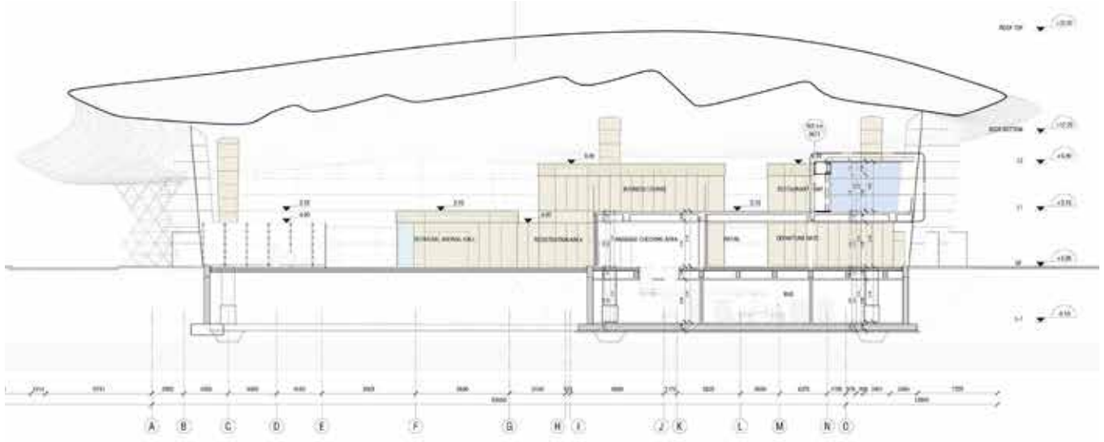

CEILING PANELS

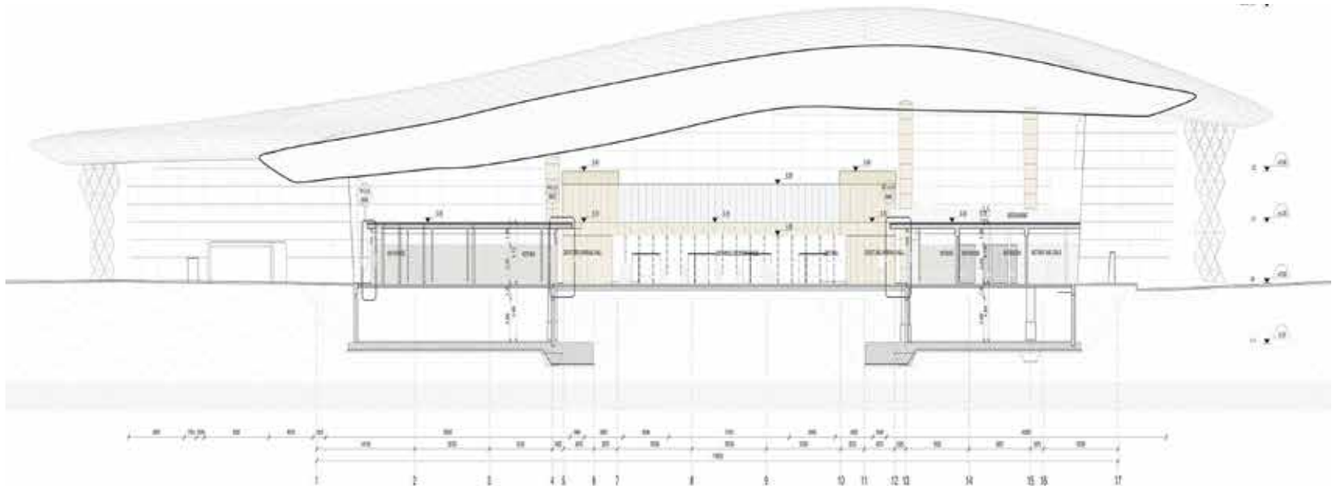


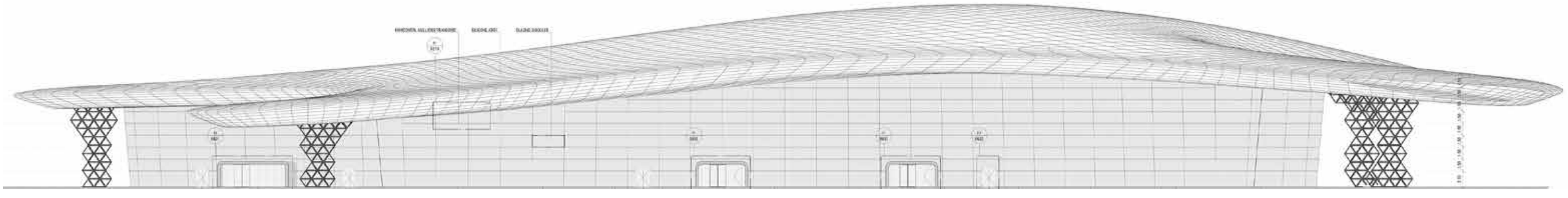

Аэропорт-Геленджик


TERRACE
TERRACE
RESTAURANT
Lounge
Lounge-Restaurant
BUSINESS LOUNGE
PRIORITY LOUNGE
Desk-Bar





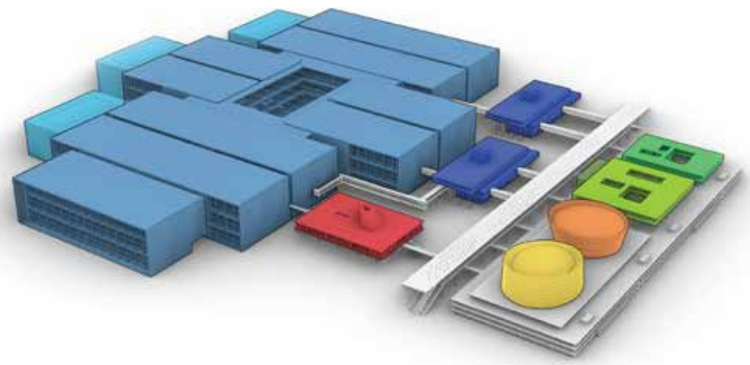


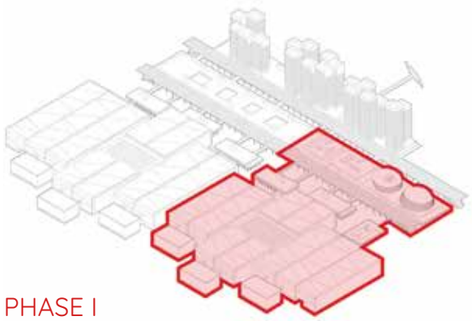


■ DUBAI GLOBAL CONNECT - DUBAI, UNITED ARAB EMIRATES

- TYPE: **BUSINESS CENTER**
- AREA: **600000m²**
- BUA: **380000m²**
- PHASE: **SCHEMATIC DESIGN / CONSTRUCTION DOCUMENTS**
- LOD: **300**
- LOI: **200**
- POSITION: **BIM COORDINATOR / ARCHITECT**

Dubai Global Connect is a huge business center, the first phase of the project contains 12 buildings, such as a business center, showrooms, warehouses, offices, academy, and auditorium. The total usable space is 350 000 sqm. The big challenge was coordinating all buildings designed by FUKSAS Studio with subcontractor from Dubai, the total amount of Revit files was more than a hundred. Another challenge was preserving the unique design of buildings, for example, roofs sculptured to reflect the shape of the dunes from a surrounded desert or as simple it is possible aluminum panels on very complex shapes with fitting in a very tight budget.

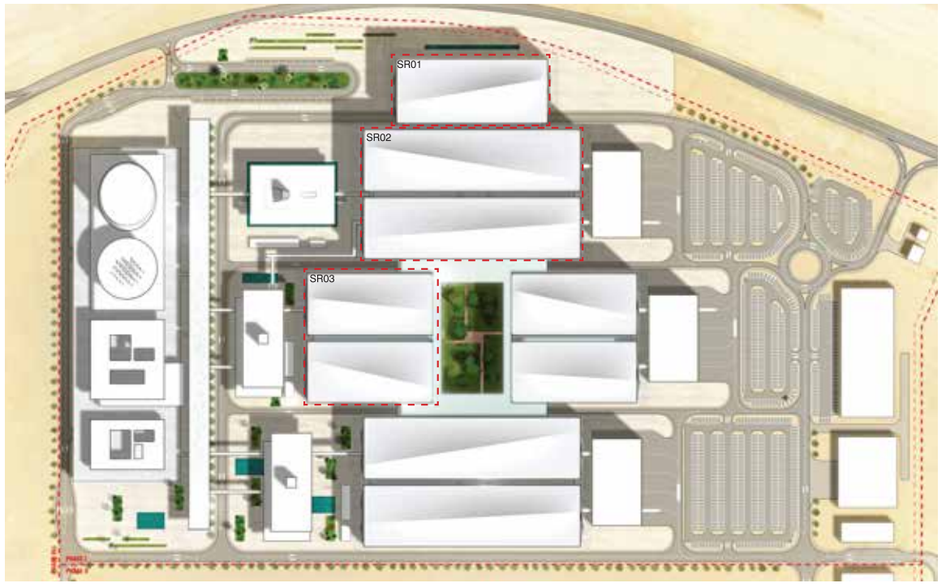




PHASE I

- **KICK OFF BUILDING**
- Showrooms
- Other - Warehouses
- Other - Boutique Offices
- Other - Food and Beverage
- Other - Reception
- Auditorium
- Innovation Hub
- Smart Services
- Academy
- Entrepeneurship Center

RESPONSIBILITIES: Solving architectural, technical and engineering problems; Coordinating project: planing workflow, designing families, solving software and hardware problems, controlling the quality of modeling and families; Creating complex custom paneling for external skins of buildings; Managing project information according to BEP (if it was suitable I was using Dynamo);



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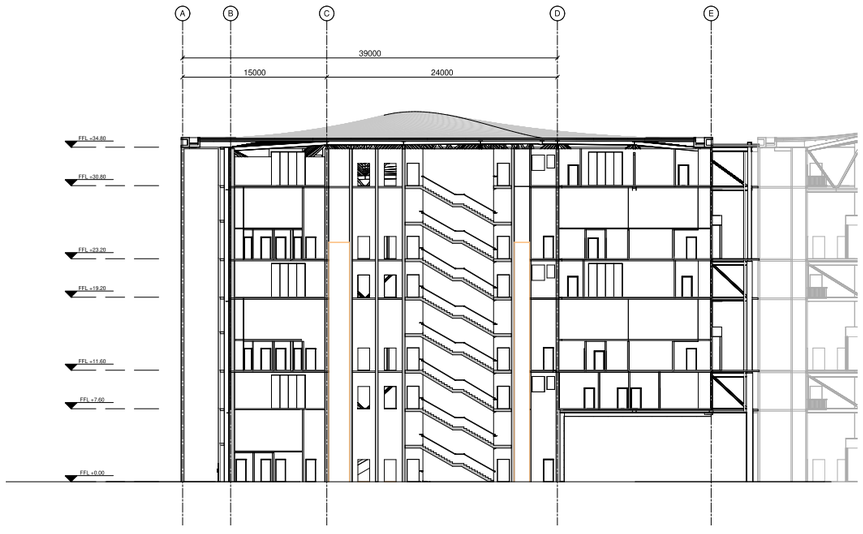
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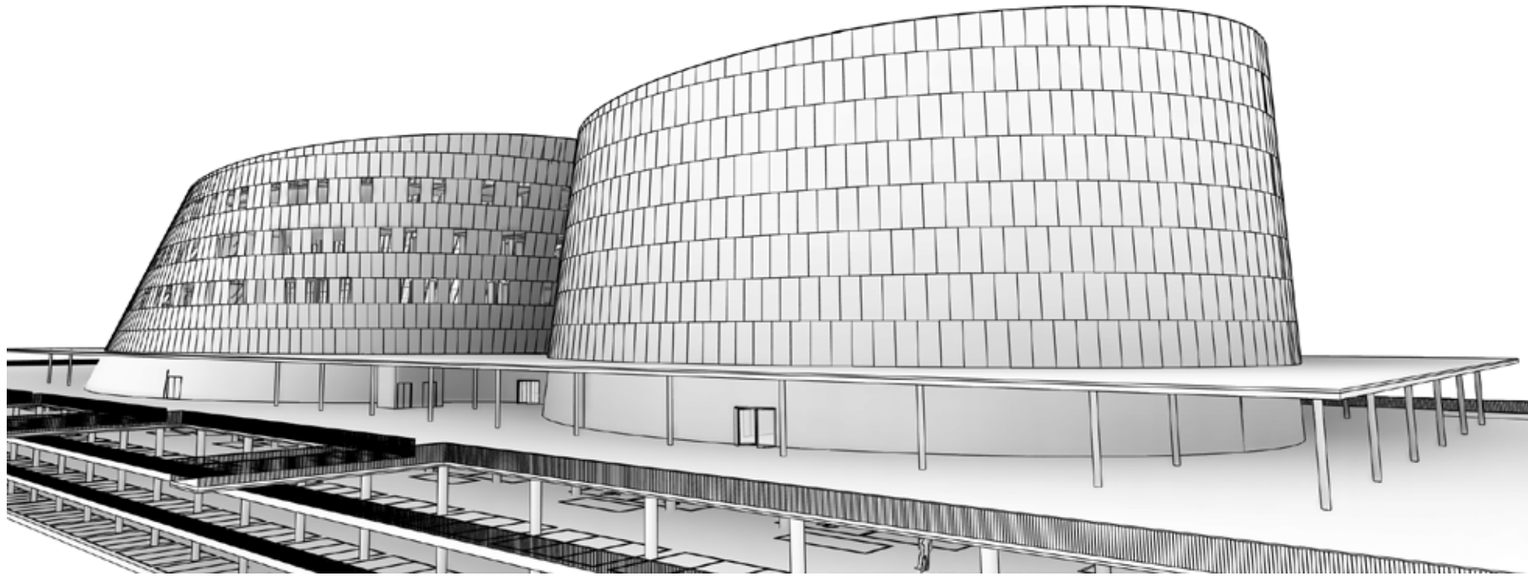
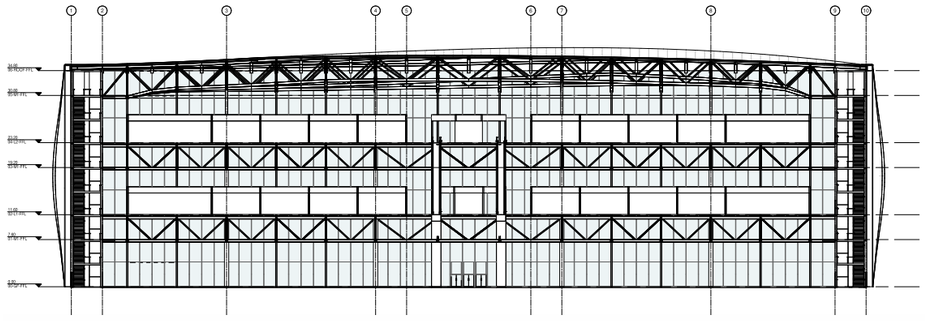
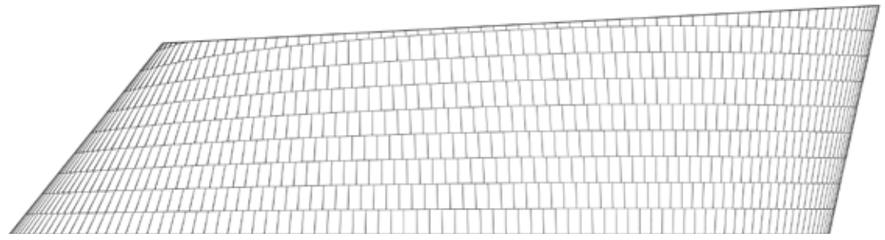
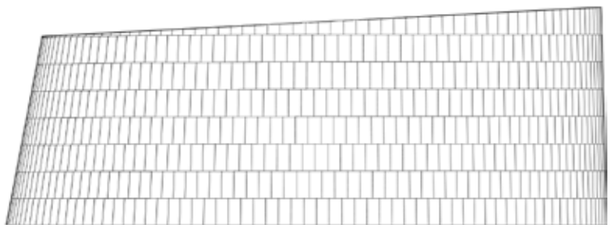
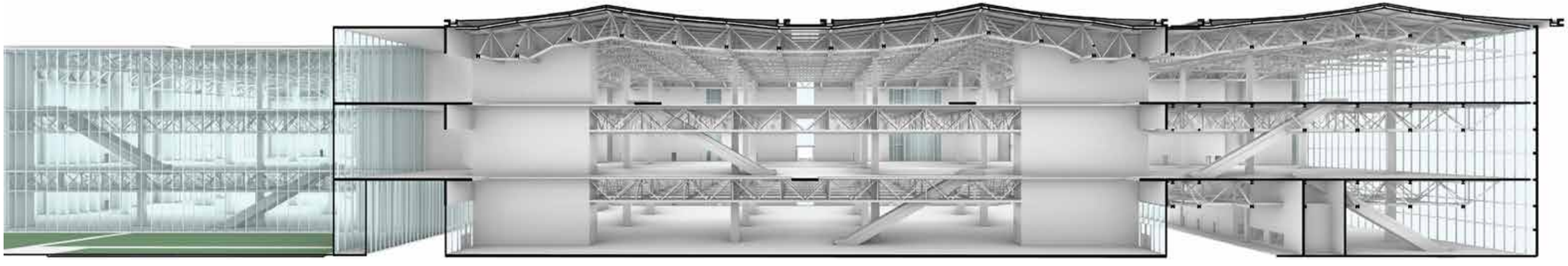


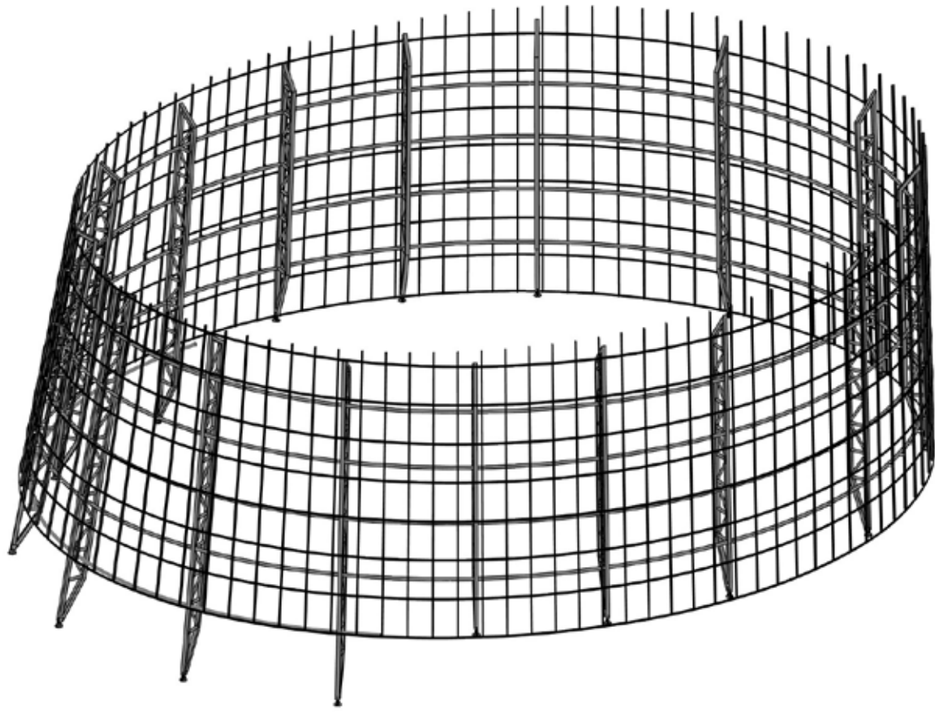




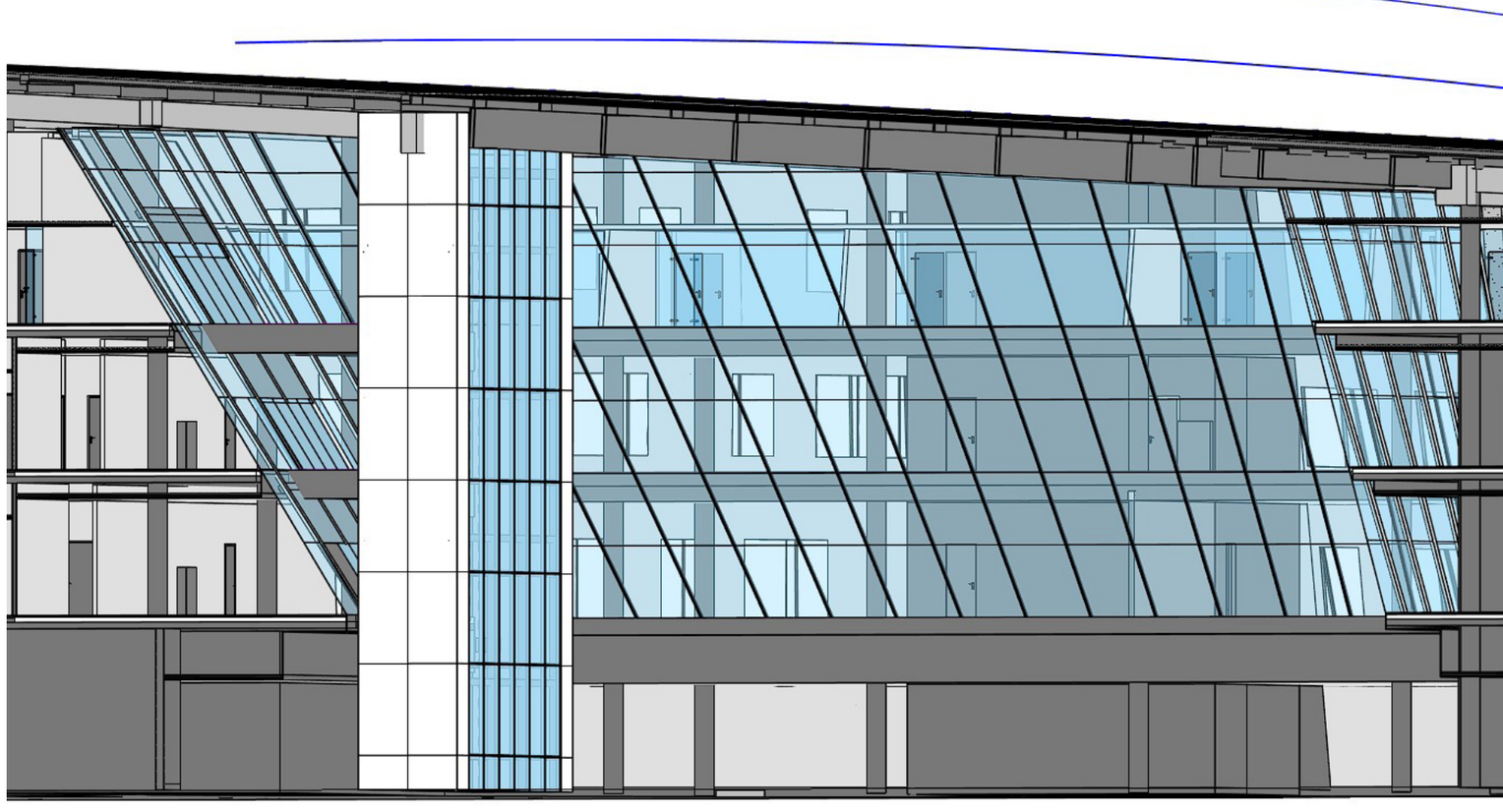




■ STRUCTURE OF AUDITORIUM

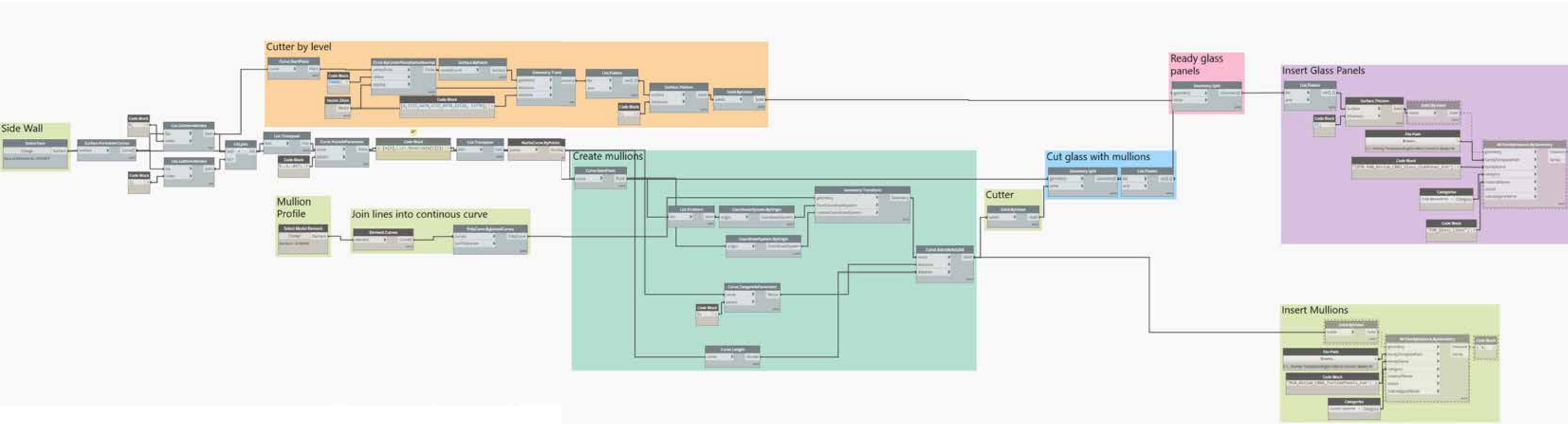


In the project of Dubai Global Connect, I designed a whole structure with parametric families of main trusses. Using Dynamo, I have distributed secondary and tertiary structures together with all joints. LOD 350



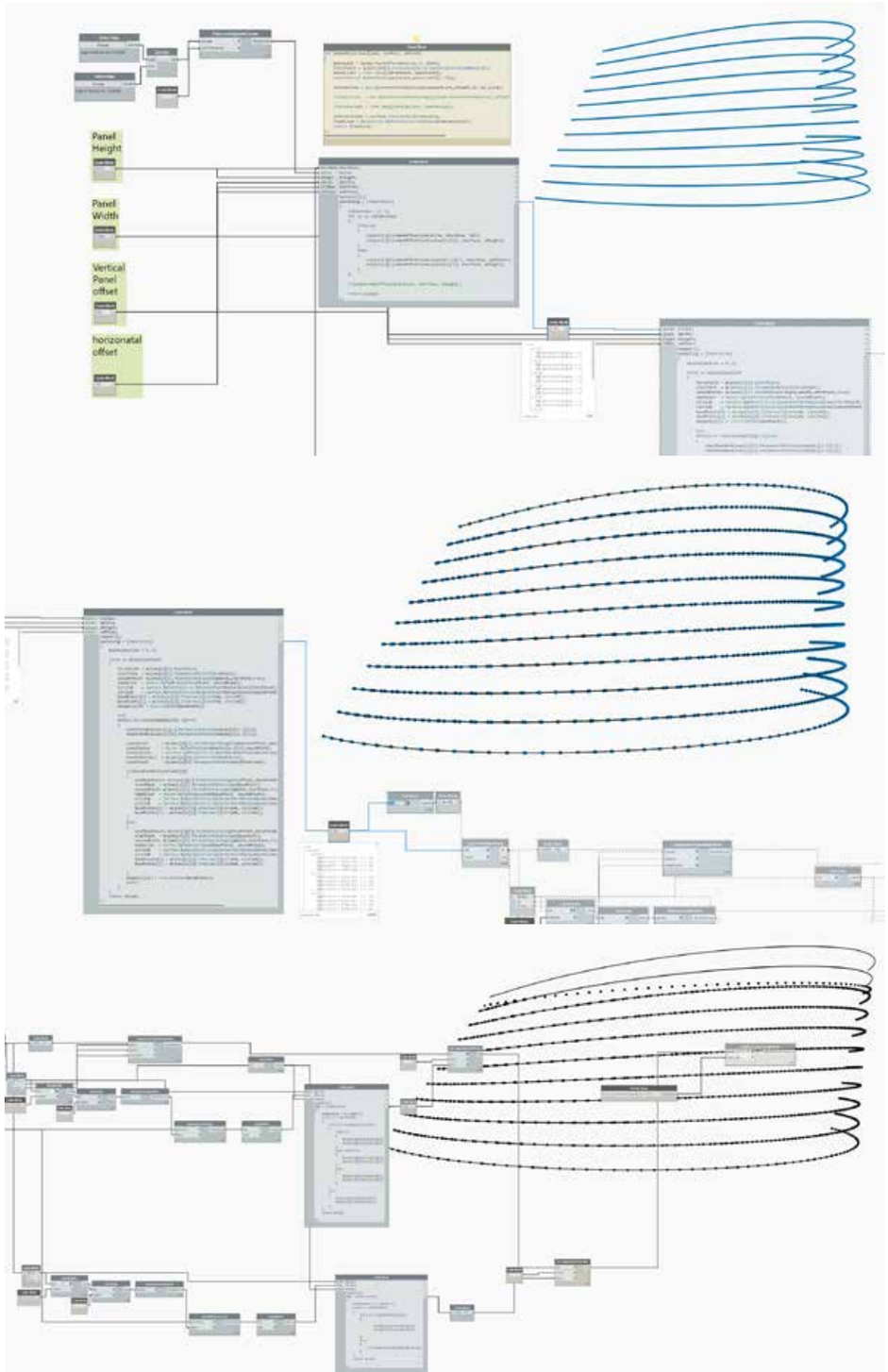
■ CREATING CUSTOM CURTAIN WALL

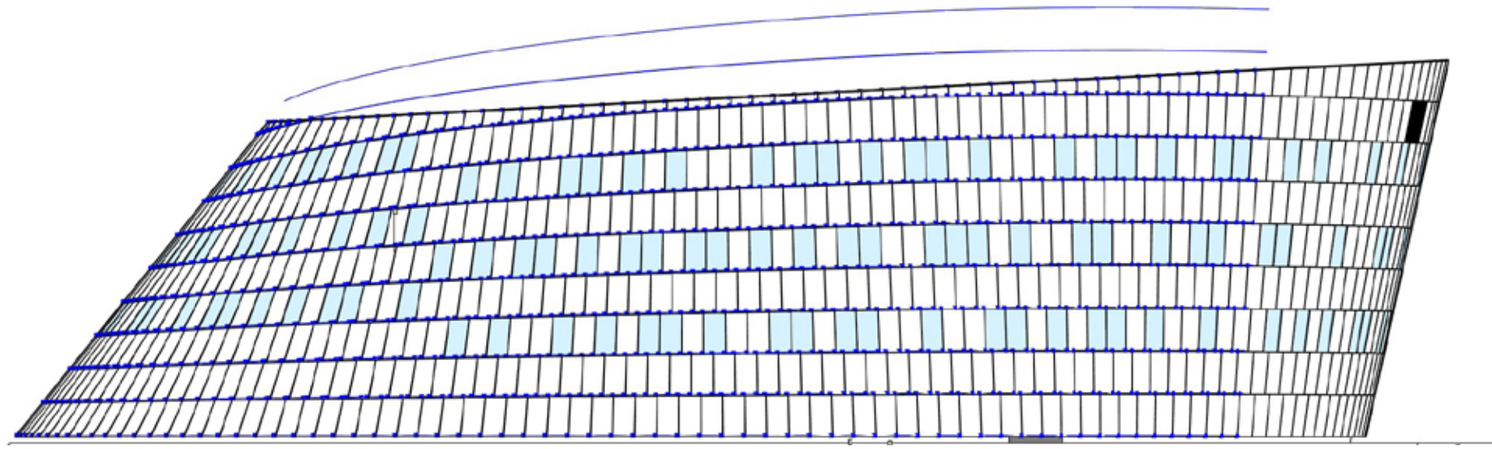
Internal curtain wall. 100% generated by Dynamo, with mullions equally distrubuted, windows inserted in them, and aligned divisions to the building levels - based on simple mass shape. LOD 300

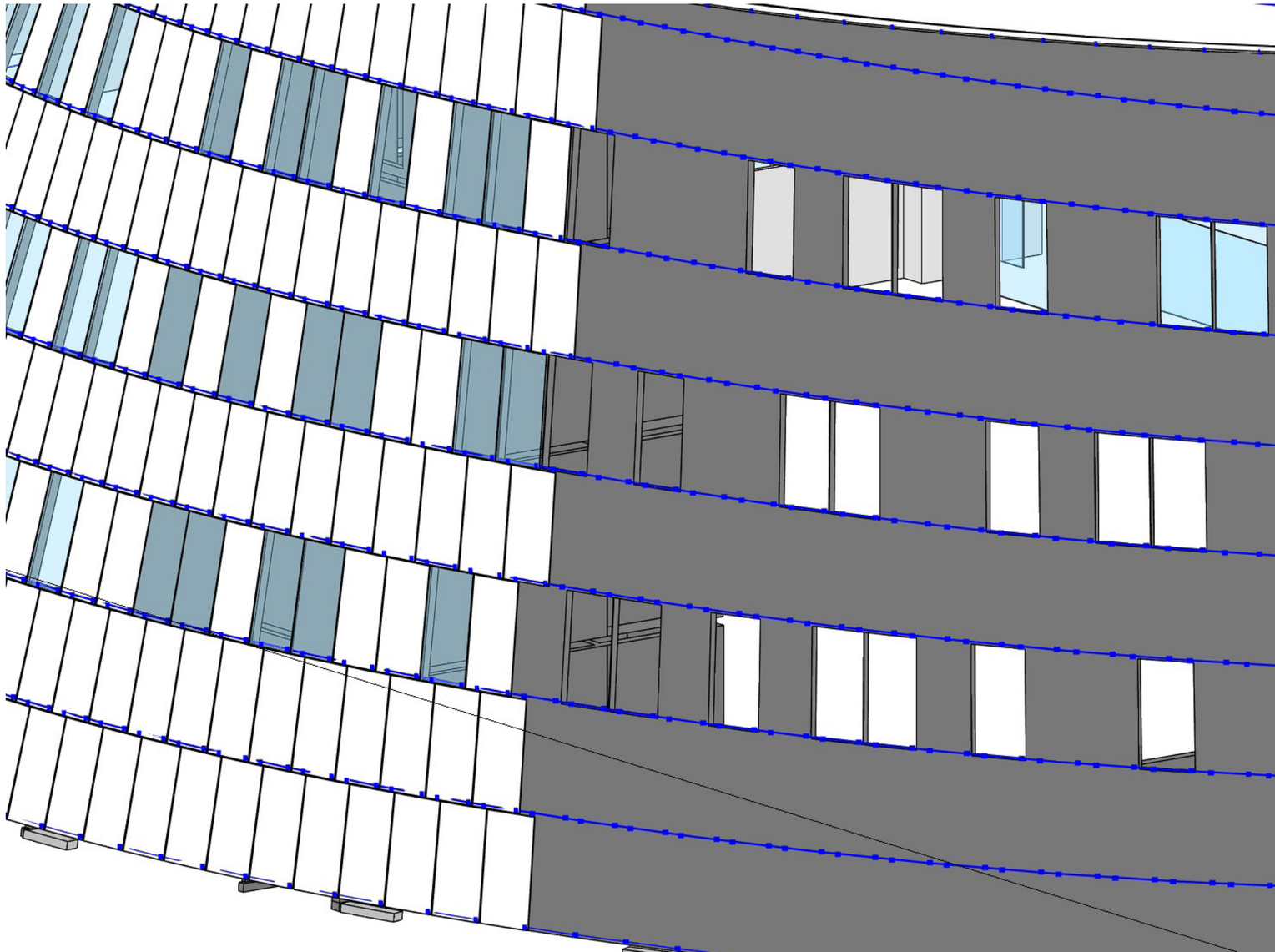


■ CUSTOM CURTAIN PANELING

One of the biggest challenges. The shape based on two different ellipses, where the top one is not horizontal - which gives an amazingly hard shape to distribute rectangular flat panels. Using descriptive geometry, I have achieved perfect distribution with a minimal amount of custom panels. Decreasing the cost of paneling drastically.







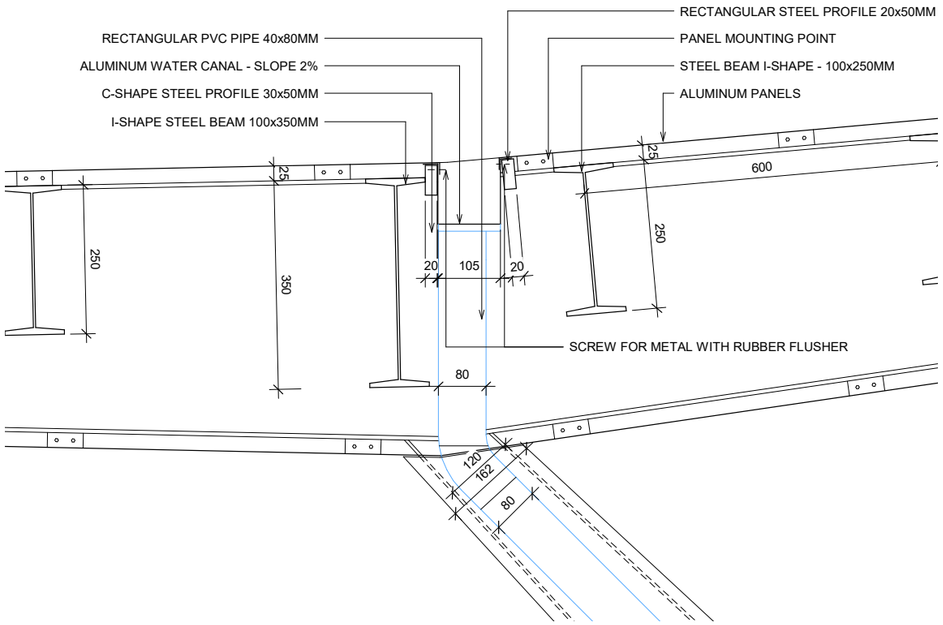
SVETA NEDELYA SQUARE

- TYPE: **PUBLIC SQUARE**
- AREA: **34000m²**
- PHASE: **SD**
- LOD: **300**
- LOI: **200**
- POSITION: **BIM COORDINATOR / ARCHITECT**

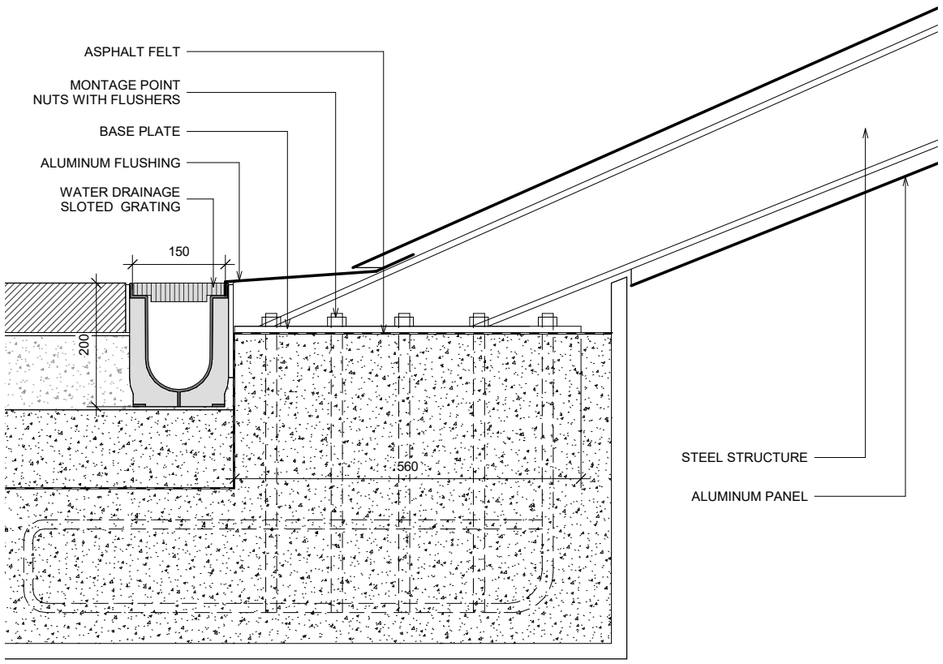
Sveta Nedelya Square in Sofia Bulgaria is a project of renovation of public space around the mosque, which is the central point of the square. The project contains entrances to a subway, an underground passage, a glazed floor above an archaeological site, a tram line with stops, green area. The whole surface of the square is soft, like natural hills, and divided into squares. All the elements of the Sveta Nedelya Square are custom designed by Massimiliano Fuksas, and I was directly involved in the design of tram shelters and subway entrances.

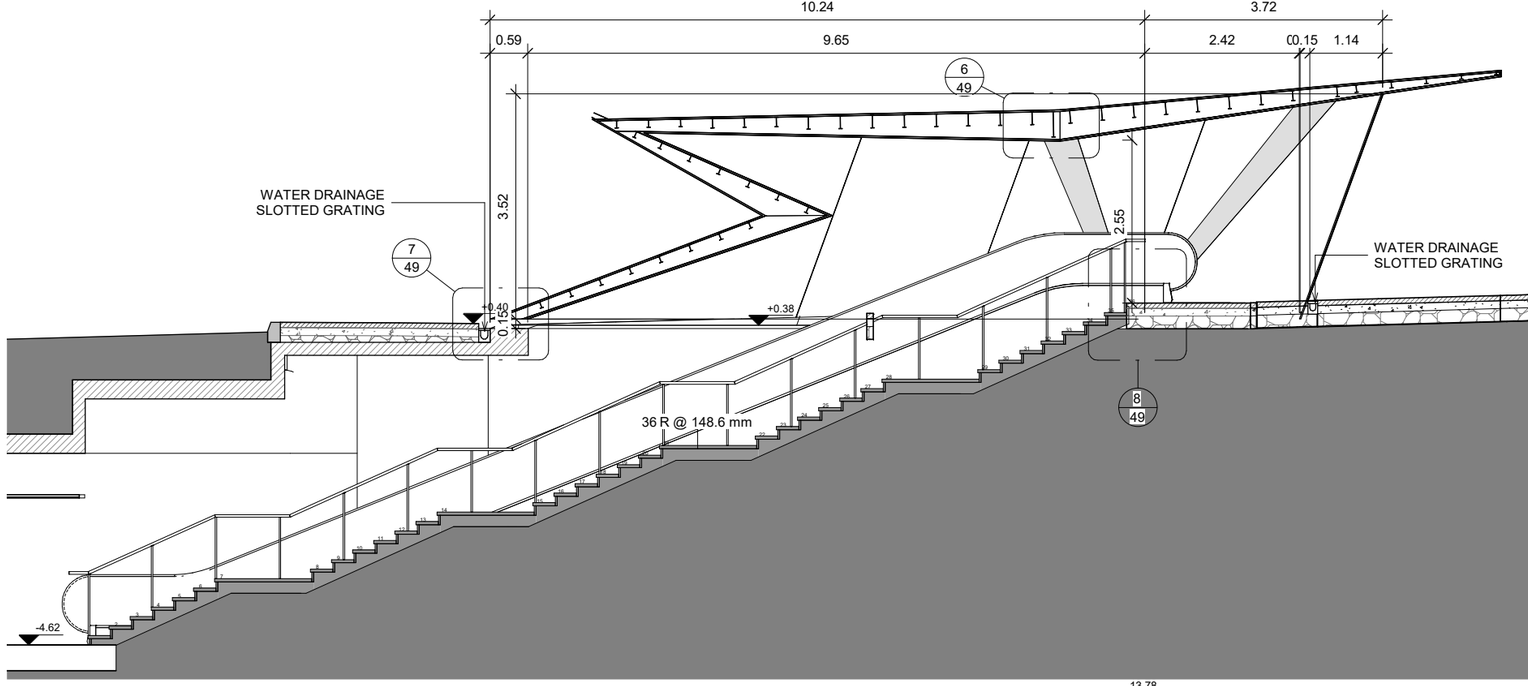
RESPONSIBILITIES: Solving architectural, technical and engineering problems; Creating complex families; Creating the main surface of the square; Modeling the context including the mosque; Creating detailed views; (if it was suitable I was using Dynamo);

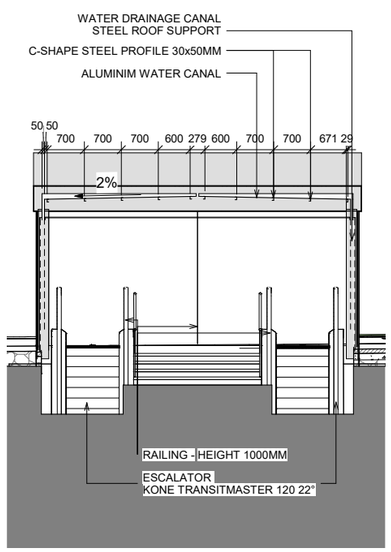
ADVANCED FAMILY OF THE METRO ENTRANCE

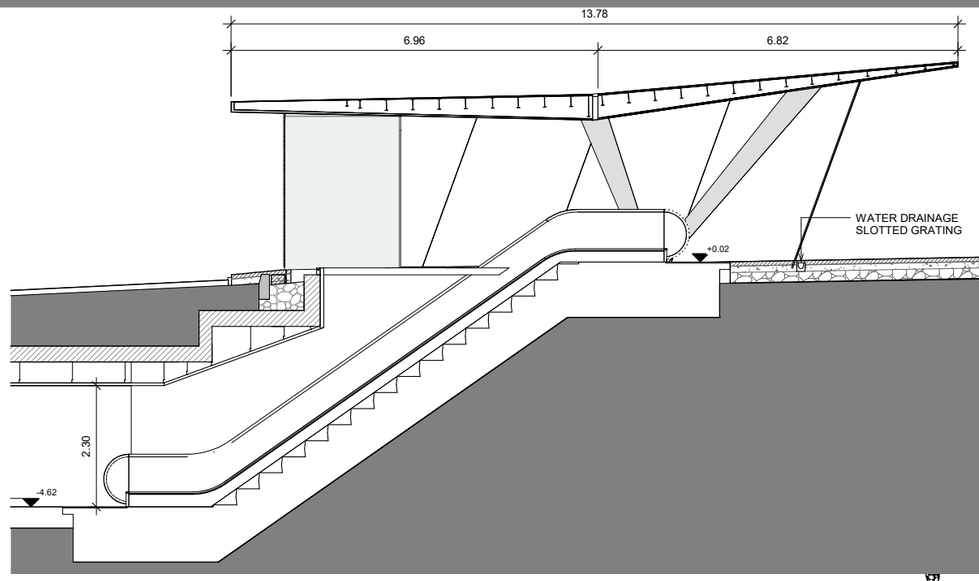


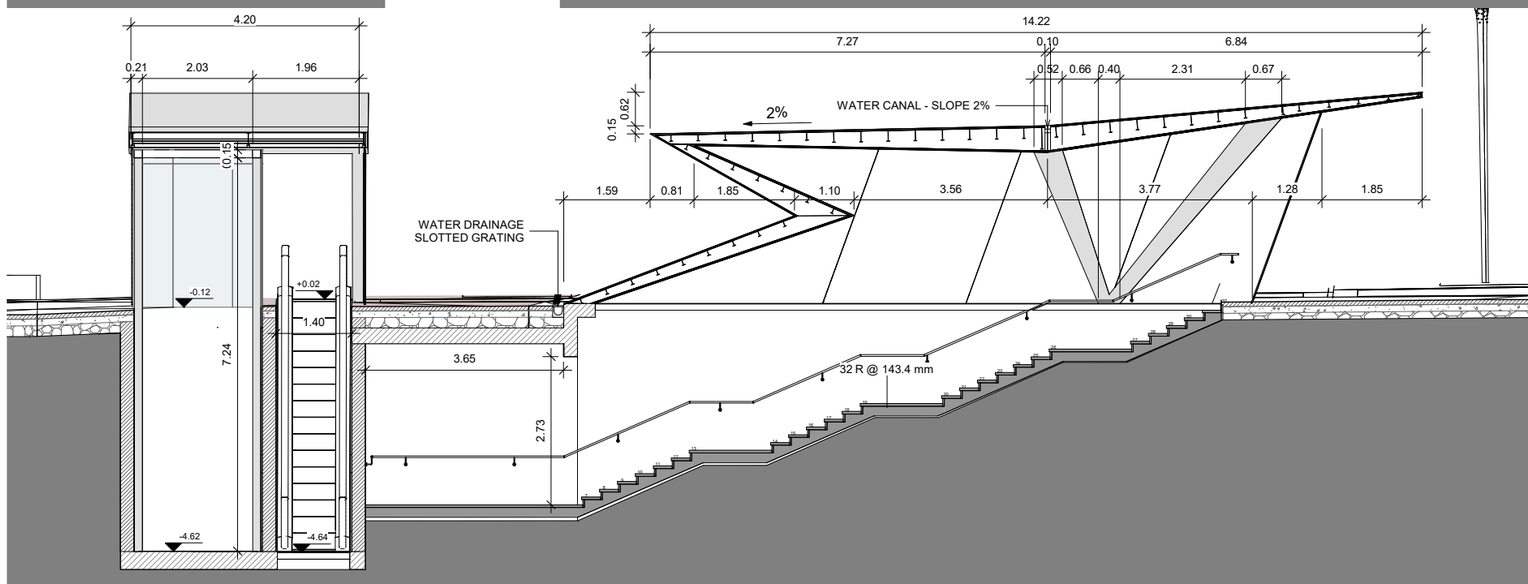
The family contains a structure and a whole paneling, parameters for length, height, angles, break points, beams types, beams distibution, and materials. I have designed the whole family based on sketches of Massimiliano Fuksas. LOD 350





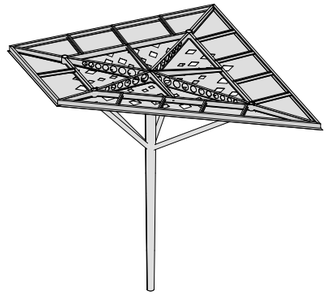


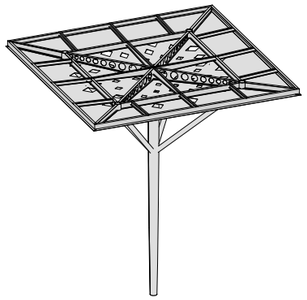


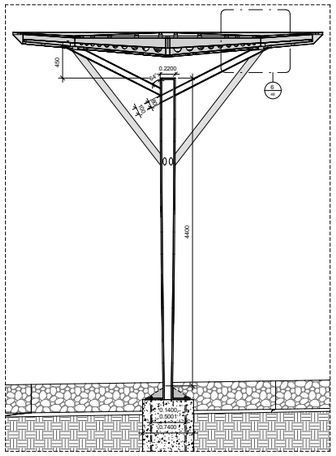


■ ADVANCED FAMILY OF THE TRAM SHELTERS

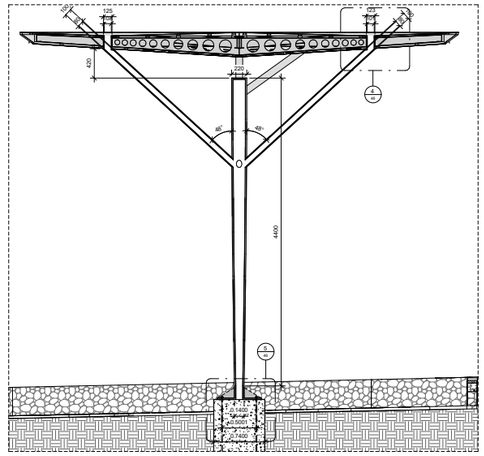
The family contains a structure and a whole paneling, parameters for rotation, height, angles, and materials. I have designed the whole family based on sketches of Massimiliano Fuksas. LOD 350



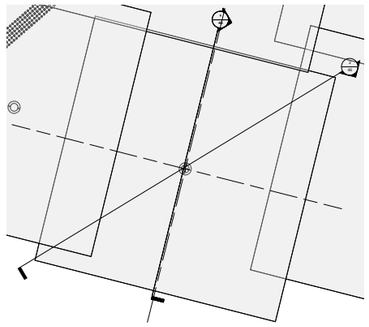




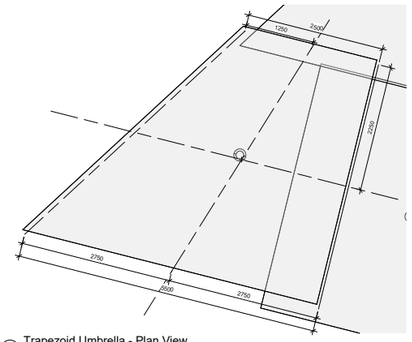
1 Umbrella - Short Section
1 : 20



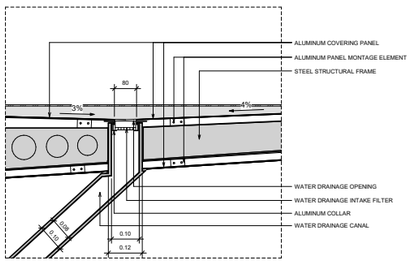
2 Umbrella - Long Section
1 : 20



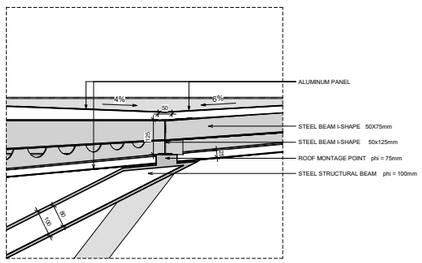
8 Umbrella - Plan View
1 : 25



9 Trapezoid Umbrella - Plan View
1 : 25



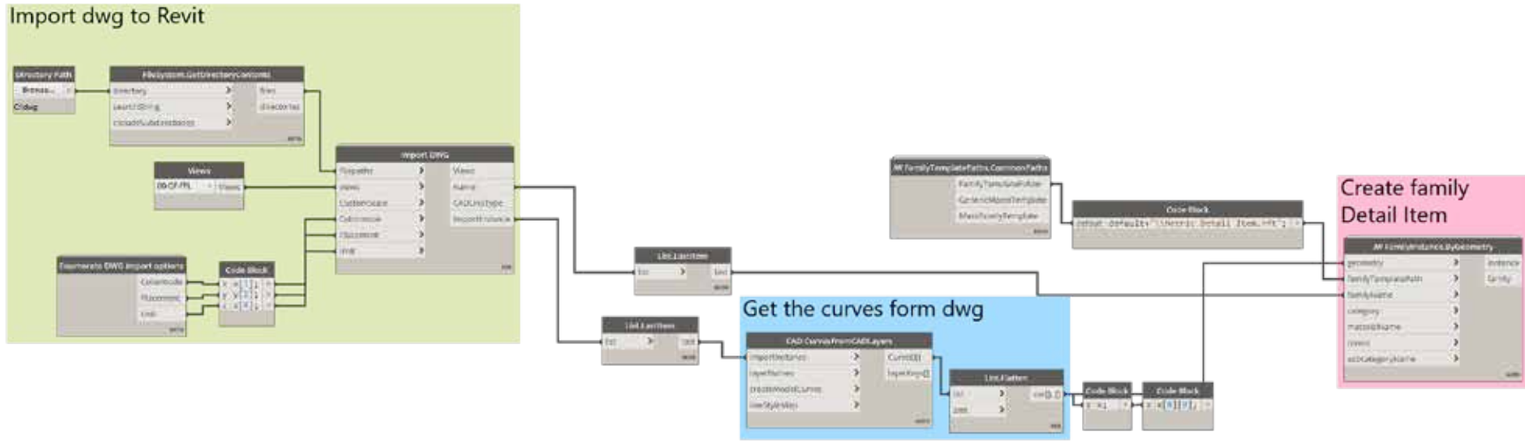
4 Umbrella - Detail 1
1 : 5



6 Umbrella - Detail 3
1 : 5

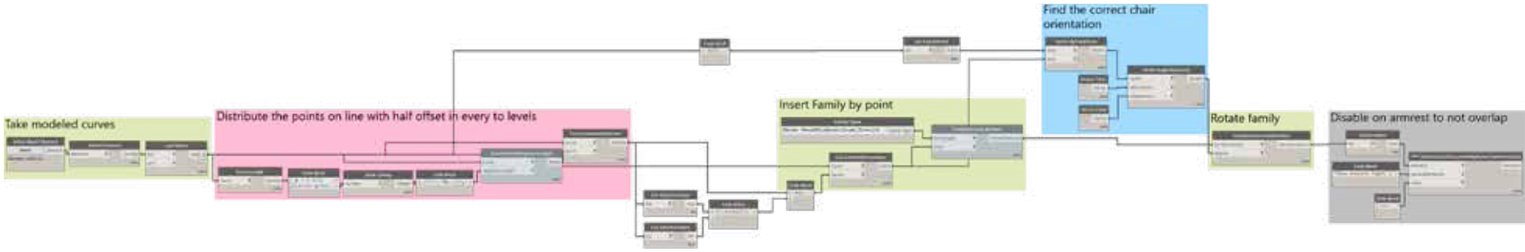
■ DYNAMO SCRIPT FOR CREATING DRAFTING VIEWS FROM DWG FILES (SHORT VERSION)

During my career, I always heard a fight: we will do details in cad because we have dwg. So, I have created the script to redraw all the details from the selected catalog.



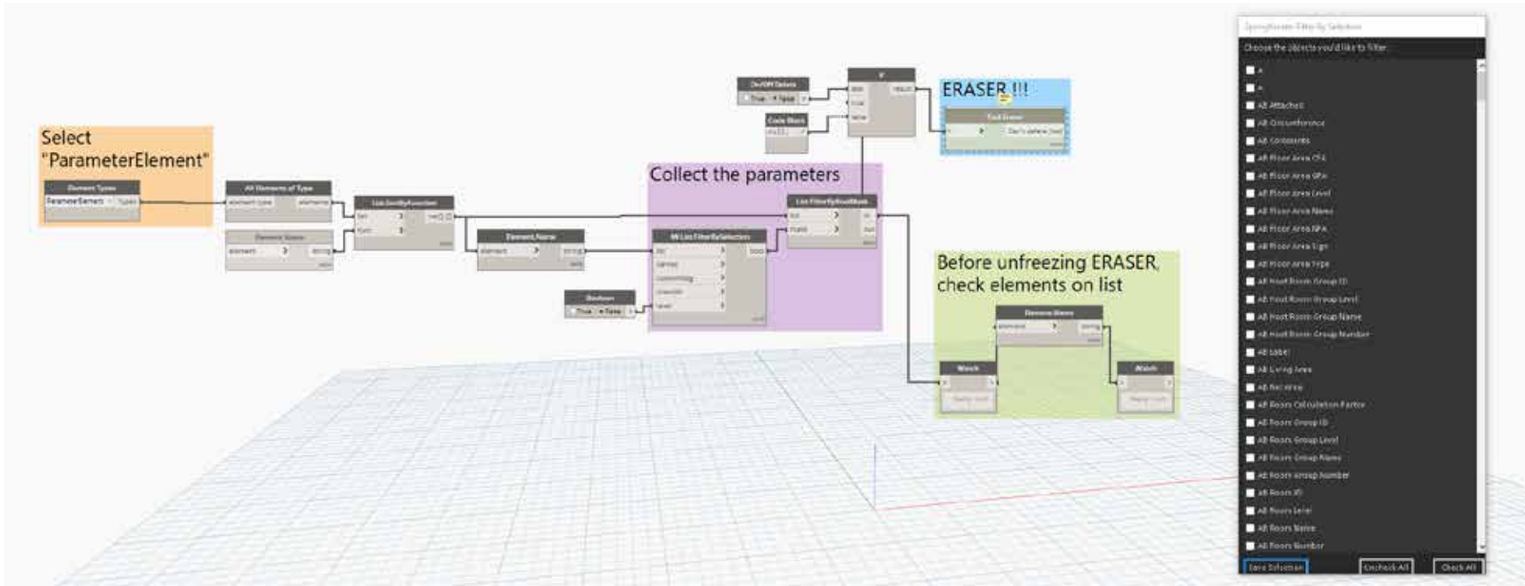
■ DYNAMO SCRIPT FOR DISTRIBUTING AN AUDIENCE CHAIRS ALONG THE AUDIENCE CURVE

A simple script to rotate all the chairs to the center point of the arc picked from the audience shape.



■ DYNAMO SCRIPT FOR DELETING PARAMITERS SELECTED BY USER

I am writing a lot of scripts for controlling the data in the models or just cleaning useless elements.



BIM MANAGEMENT

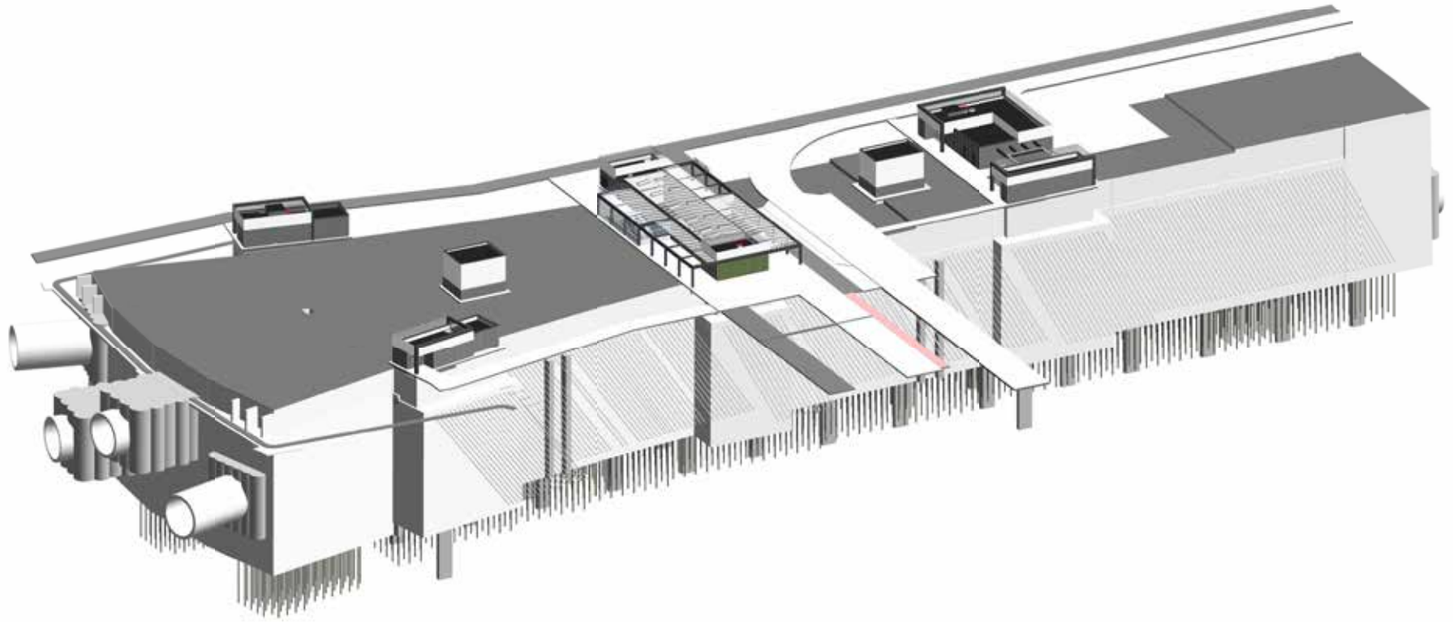
WARSAW - POLAND

In this section you can find examples of the projects for which I was responsible as a BIM manager and an architect. Between 2020 and 2022 I cooperated with those architectural studios: Tremend, Maka-Sojka Architekci, TRZOP Architekci, Best Building Consultants.

TREMEND

- PROJECT: **METRO ZACHÓD 8**
- TYPE: **APARTMENTS**
- AREA: **48 000m²**
- PHASE: **CONSTRUCTION DOCUMENTS**
- LOD: **300**
- LOI: **250**
- NUMBER OF BUILDINGS: **8**
- SCOPE OF CONTRACT: **CONSTRUCTION PERMISION**

These are eight apartment buildings designed and managed by one of the biggest developers in Poland. All of the buildings are attached to the master file. Data transfer with the client is possible through the BIM360 (models, sheets, comments, documents).

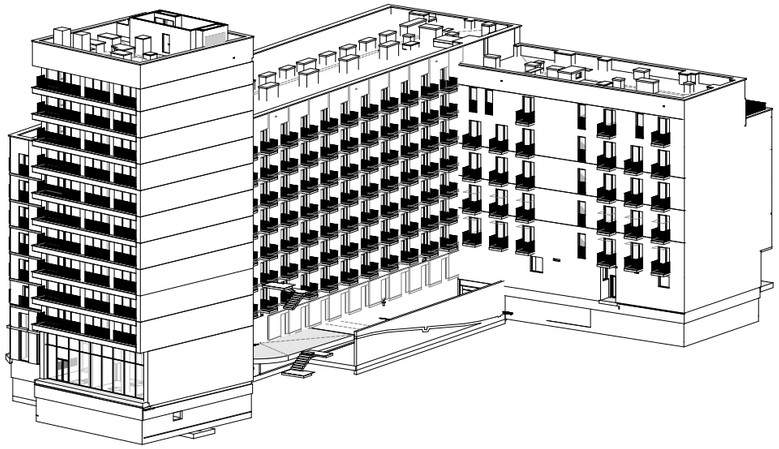


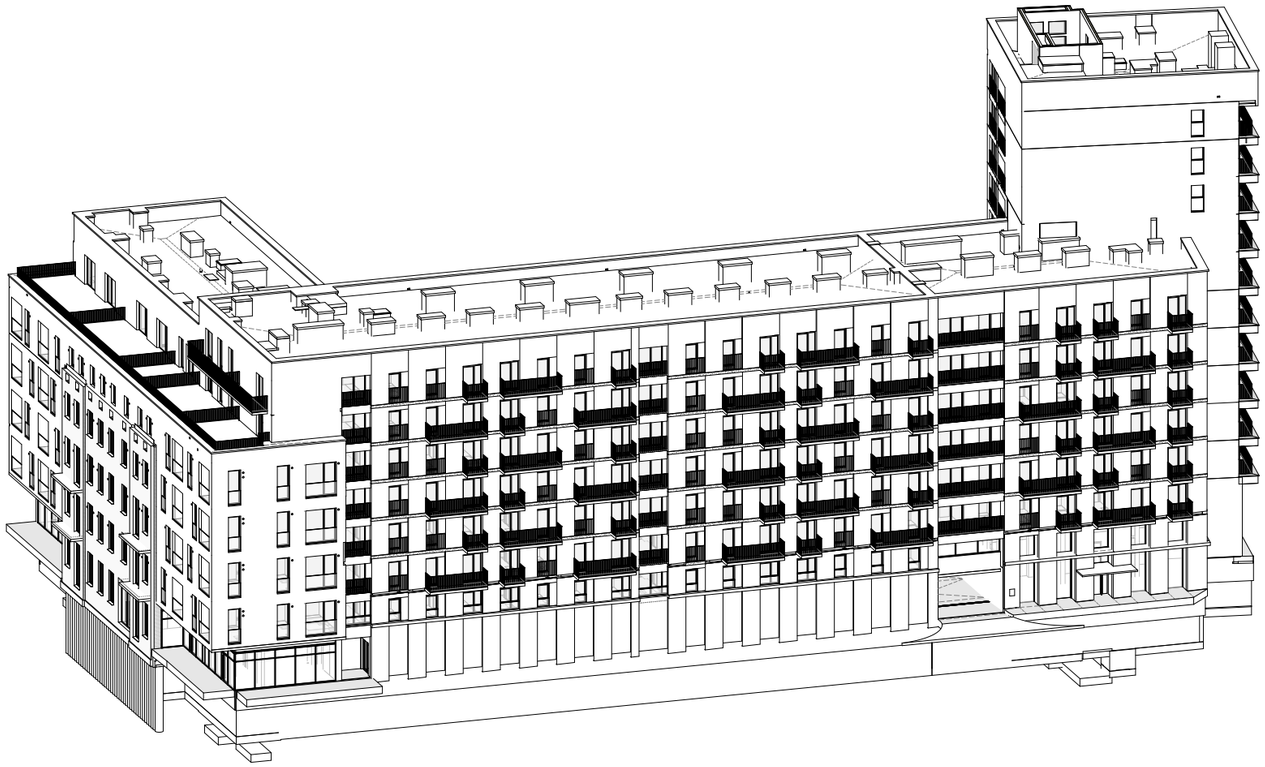
- PROJECT: **ŁÓDZ FABRYCZNA**
- TYPE: **TRAIN STATION**
- AREA: **40 000m²**
- PHASE: **CONSTRUCTION DOCUMENTS**
- LOD: **300**
- LOI: **350**
- SCOPE OF CONTRACT: **TECNICAL DOCUMENTATION**

For the train station project, I created dynamo scripts and families and solved all of the problems related to Revit and BIM processes.

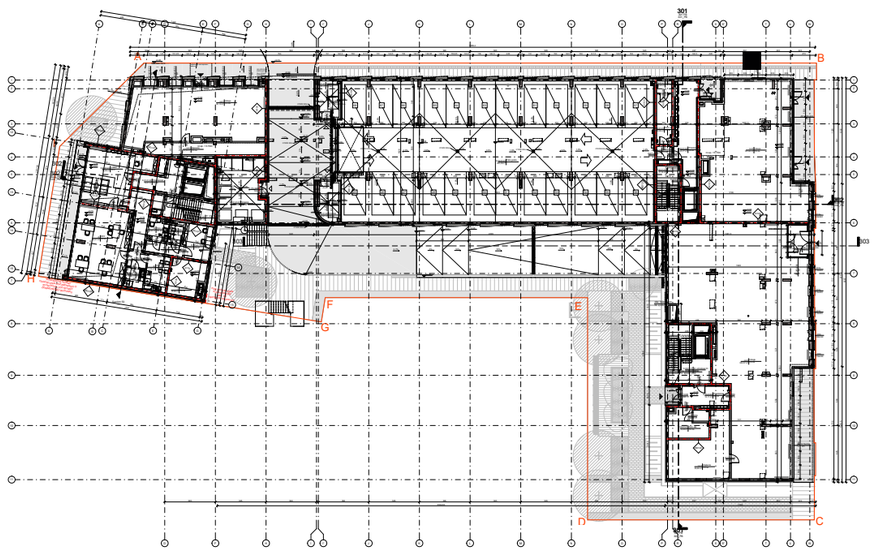
MĄKA SOJKA ARCHITEKCI

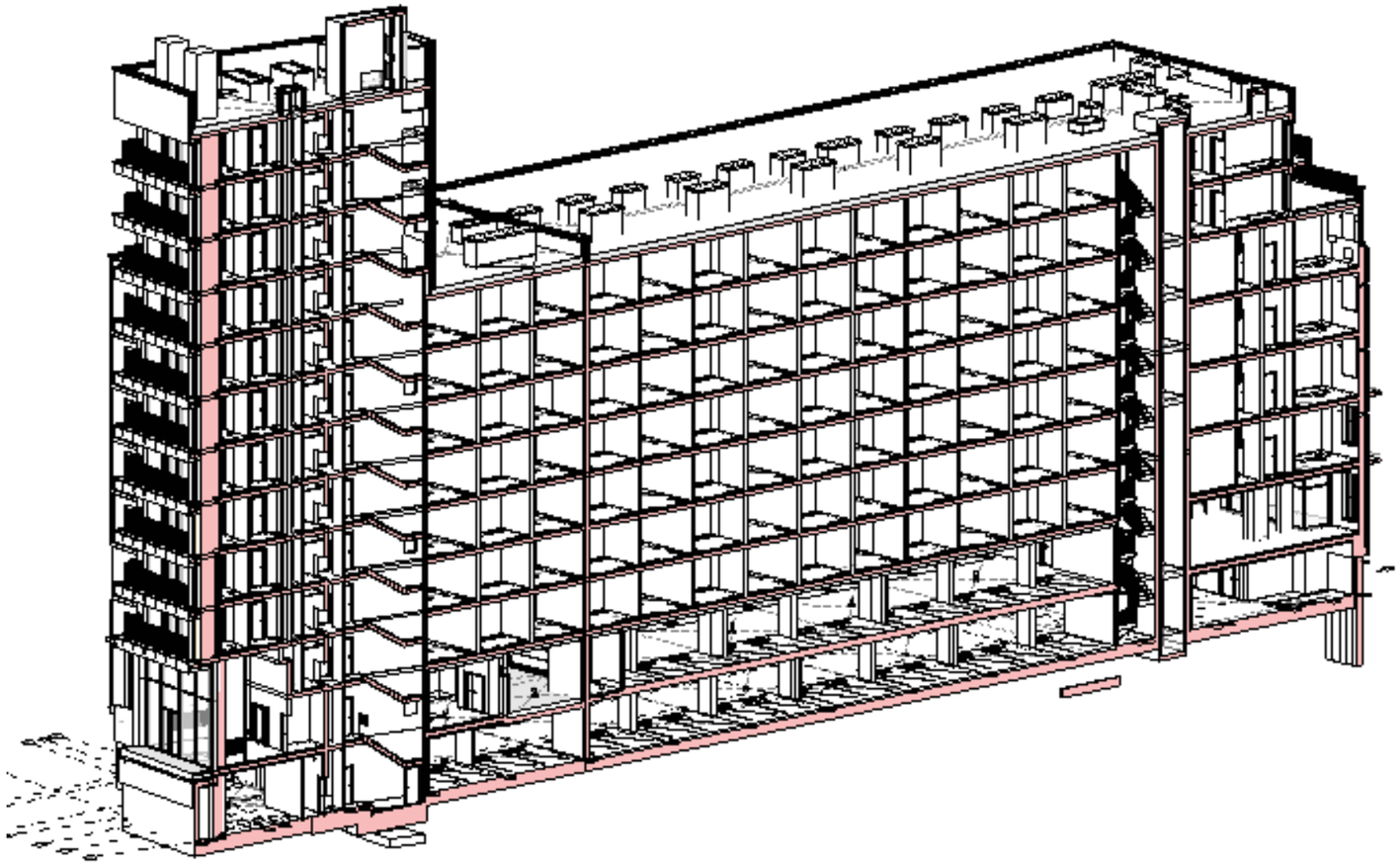
- PROJECT: **RESI4RENT**
- TYPE: **HOTEL/APARTMENTS**
- AREA: **15 000m²**
- PHASE: **CONSTRUCTION DOCUMENTS**
- LOD: **300**
- LOI: **250**
- NUMBER OF BUILDINGS: **2**
- SCOPE OF CONTRACT: **CONSTRUCTION PERMISION**





It is the apartment building I managed right up to the final delivery of the detailed design project. I was creating all standards, families, guidelines for the team and dynamo scripts. Also, I was providing training for the team from Revit.





BEST BUILDING CONSULTANTS

WARSAW - POLAND

Best Building Consultant is a company focused on public procurement and competitions for public buildings, factories, offices, police buildings but also the place where I have started my professional experience.

OFFICES “CALIFORNIA”

- TYPE: **OFFICES**
- AREA: **50000m²**
- PHASE: **DETAL DESIGN**
- LOD&LOI: **350**
- LOCATION: **KIELCE, POLAND**

Office building A Class designed for startups, giving space for rent including gym/fitness, conference rooms, and underground parking. The characteristic element of the building is a terrace on the corner, which was stylized to look like it is cut from the shape, leaving upper floors without the support. My skills and knowledge were noticed quickly thanks to that I was assigned to most difficult tasks, including solving structural problems with cooperation with the structural team, which is part of the studio.

In the studio, I was working on an adaptation old testing laboratory to new needs and new regulations. Also, I was working by my self on the detail design of technical buildings for railway operator - PKP.

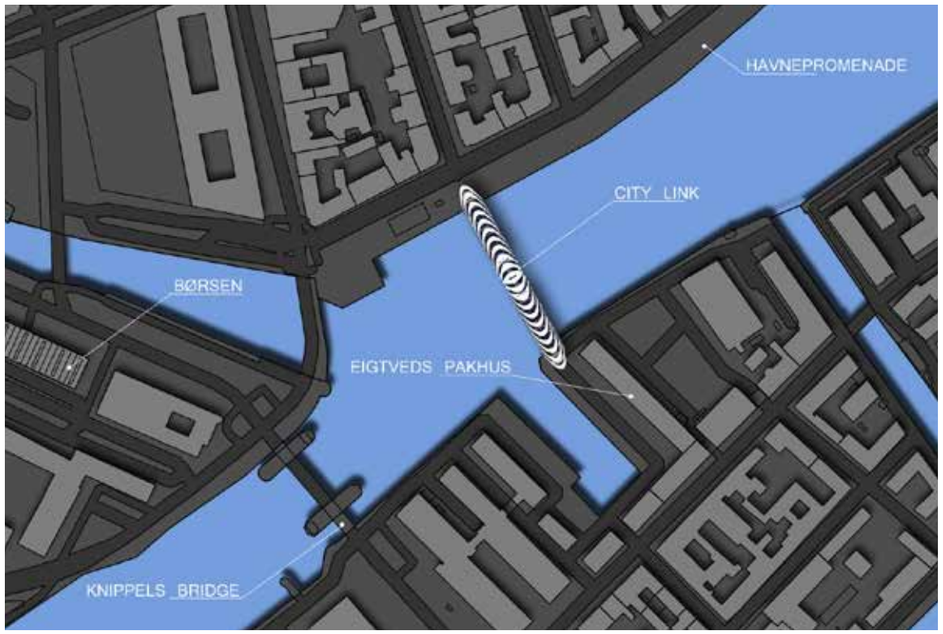
EXTRAS

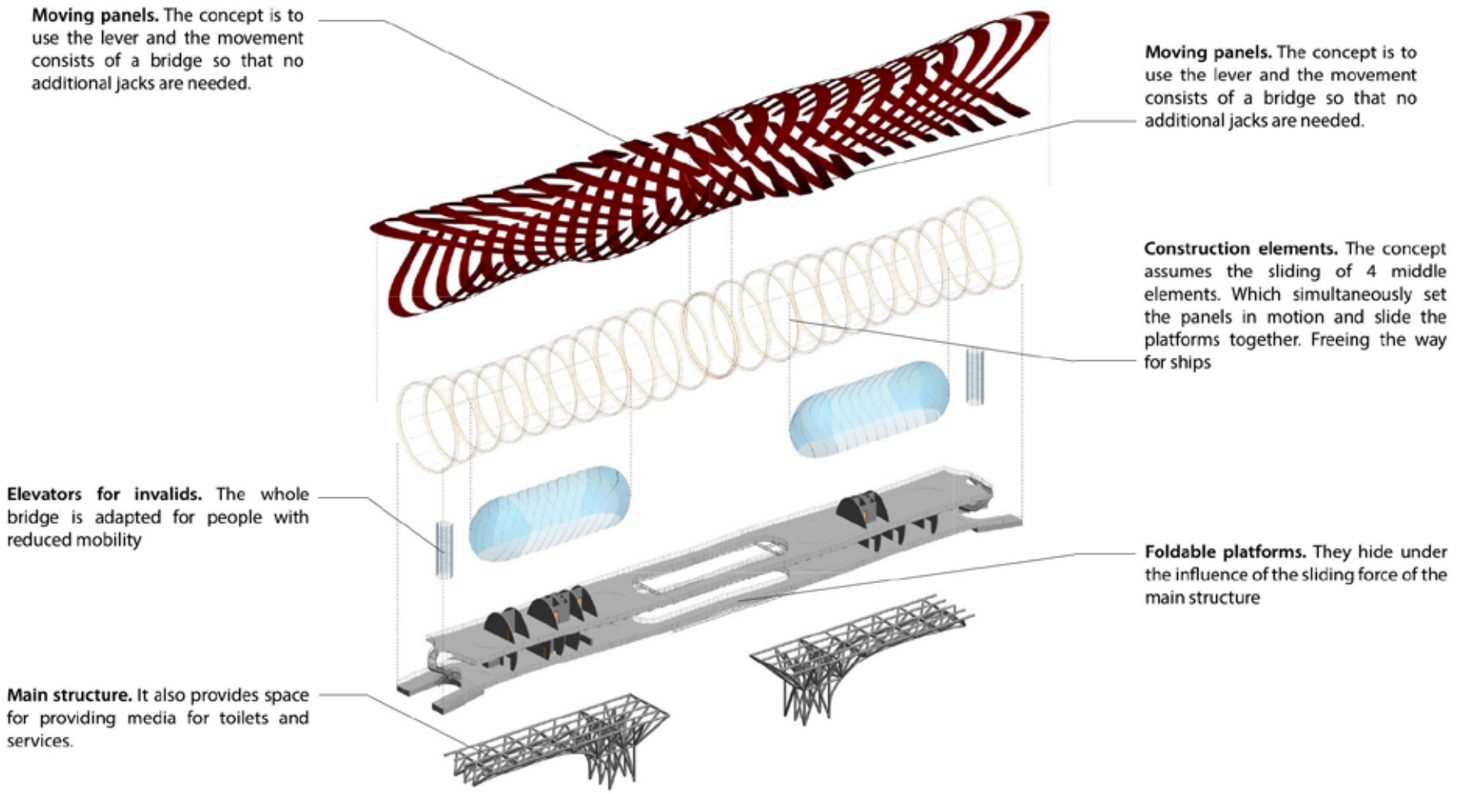
As an architect, I am participating in various competitions, local and international. Also because of my passions, I like to design for my self, finding complex shapes that I can later solve by coding or other techniques and software.

CITY-LINK COMPETITION

- TYPE: **BRIDGE**
- AREA: **1000m²**
- PHASE: **CONCEPT DESIGN**
- LOCATION: **DENMARK, COPENHAGEN**

The main task in City Link competition was to design an openable footbridge that will be also a place for bikers. The function of the bridge could be for example space for gatherings, bike rental, bike workshop, or even cyclist club. The bridge should become a landmark of Copenhagen, so I decided to open the water pass in unconventionally, and also during the movement give it looks of morphing - almost the whole shape of the bridge was affected by opening for the ships. Most of the structure was generated by Dynamo and the shape was sculpted in 3ds max, then everything merged in Revit.



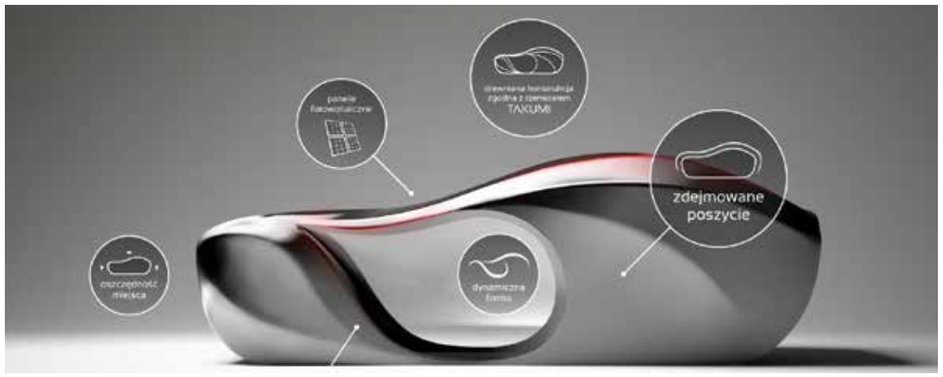


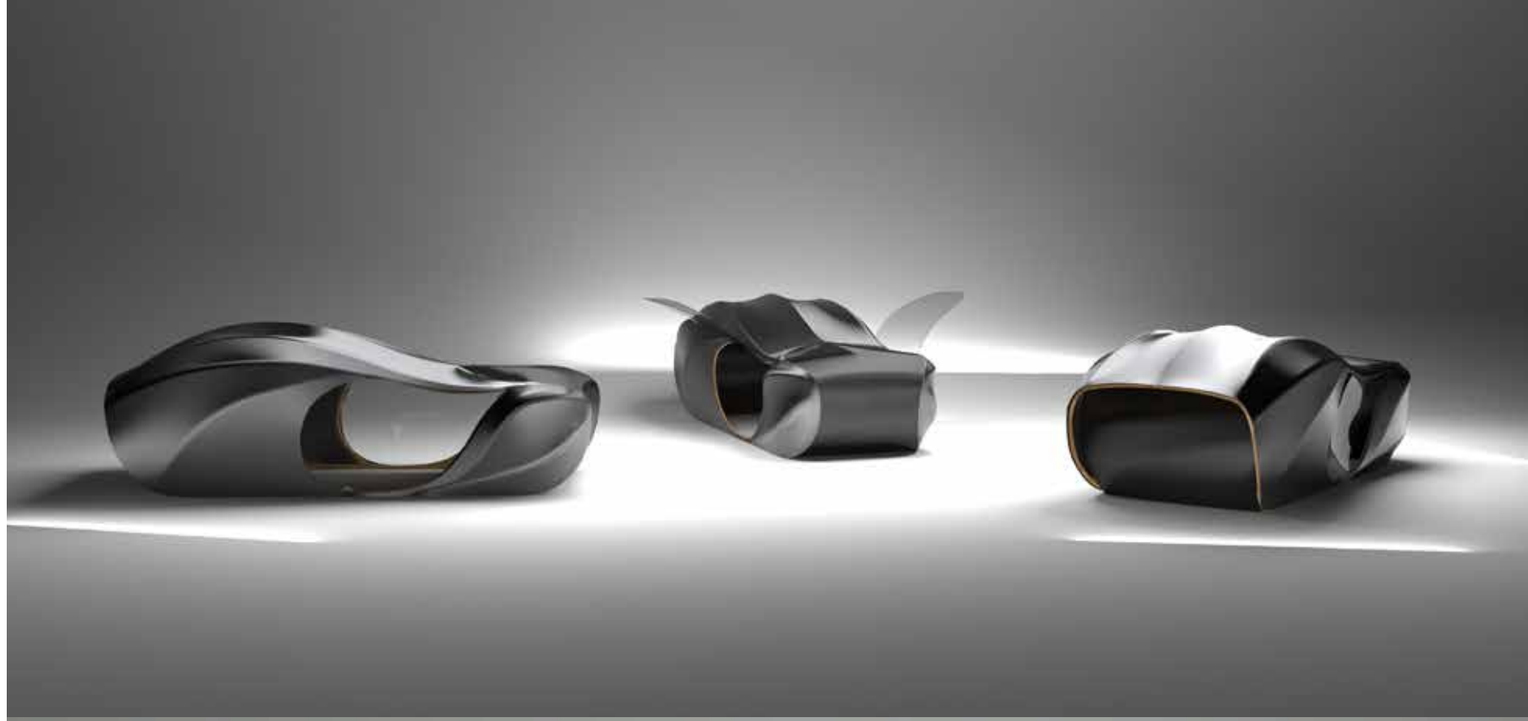
MAZDA DESIGN COMPETITION

- TYPE: **GARAGE**
- AREA: **20m²**
- PHASE: **CONCEPT DESIGN**
- LOCATION: **POLAND**

A yearly competition organized by the Polish division of Mazda. From three categories, I have picked a garage for a new model of Mazda 6 for future cities. The concept should take into consideration the fast-growing urban environment, lack of space, but also refer to traditional Japanese techniques of sculpting the wood and Mazda Design Philosophy - KODO. My idea was to create a wooden frame covered by material that can fit in parking space and giving you the functionality of the garage. Useful features are removable skin and set of photovoltaic panels for heating, charging, lighting, alarm of the garage.

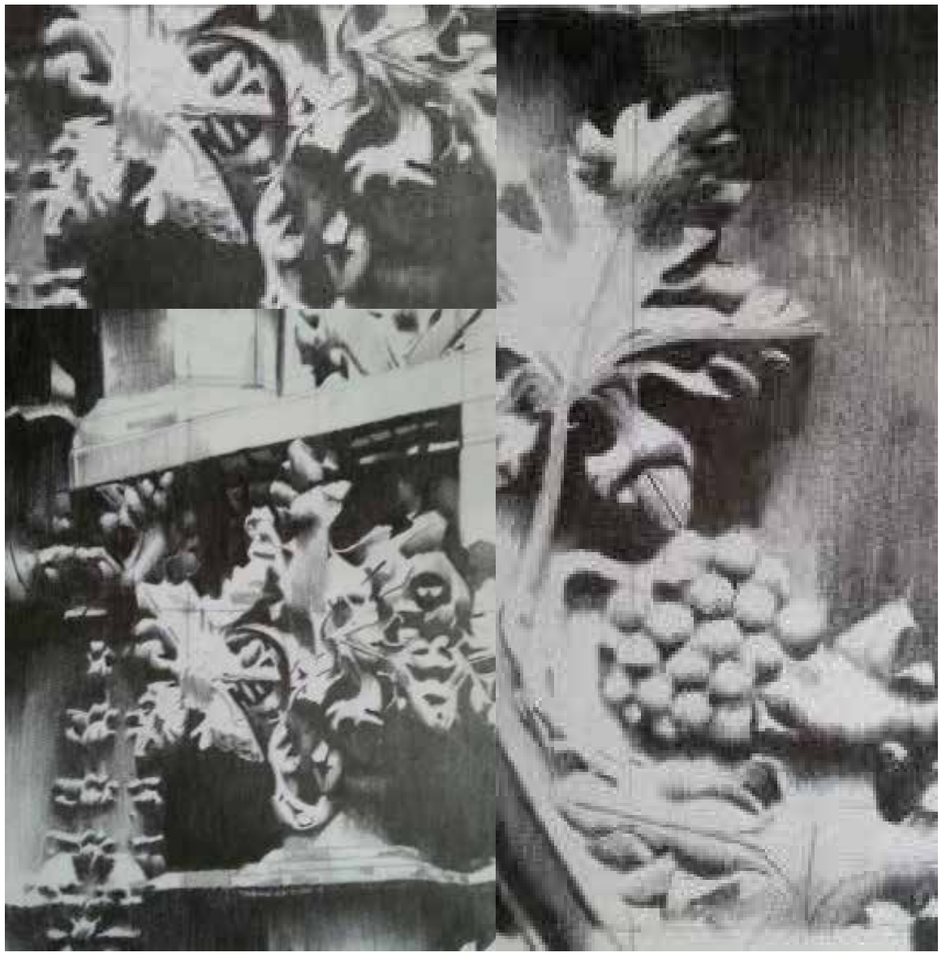
Inspiration for the structural frame was the Japanese technic of sculpturing the wood TAKUMI and Mazda Design Philosophy KODO. The effect of that is a frame that can be used without cover and still preserving the esthetic and dynamic shape. The form of the garage is a visible connection with the cars of Mazda.

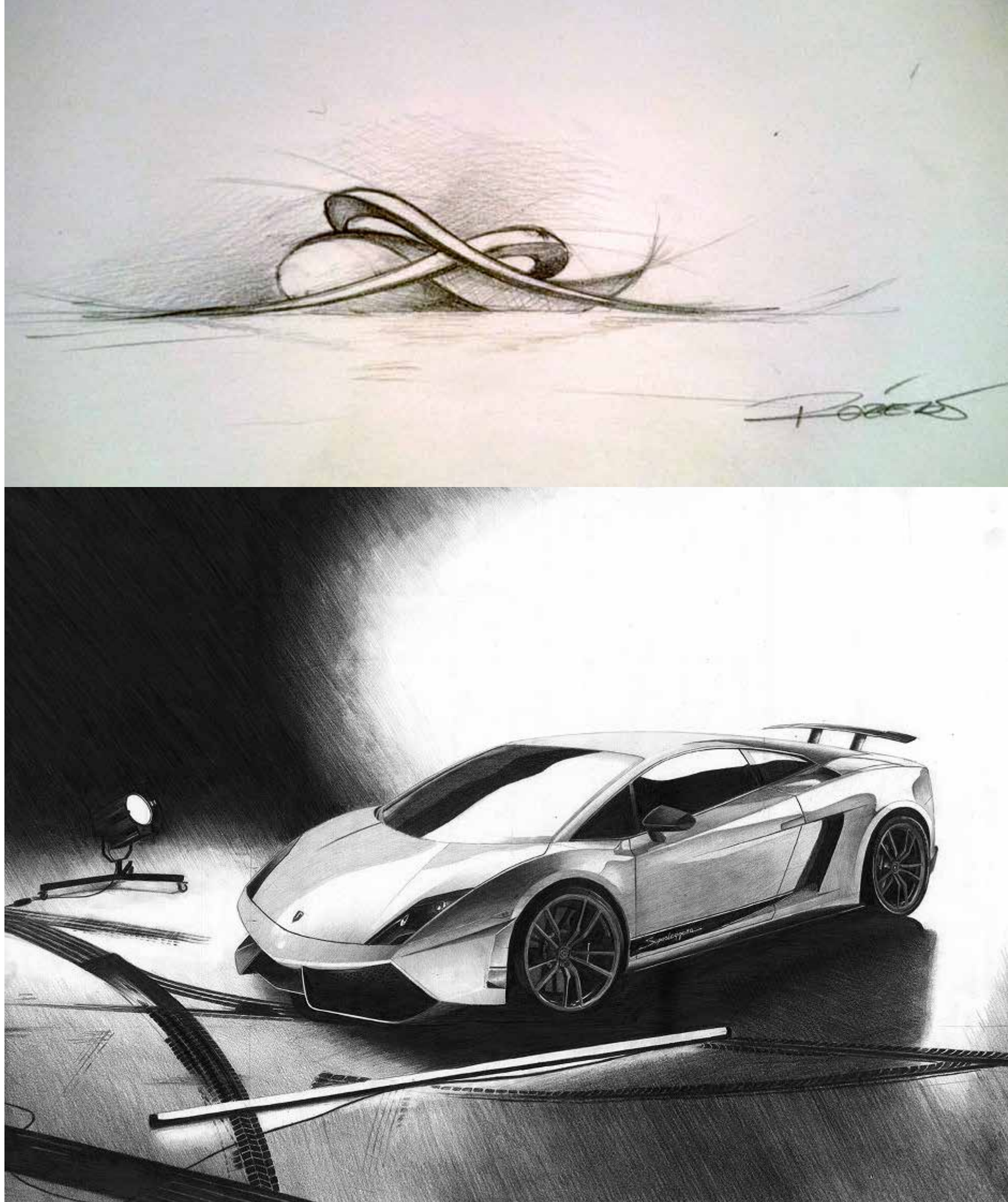




DRAWINGS

Drawing or sketching for me is the best way to transfer my thoughts into the real world, freeflow on the paper gives unlimited possibilities. All of my projects, concepts started their life on the paper, often on the piece of scrap paper, because inspirations came suddenly. Also, I can spend a lot of time creating very detailed drawings, base on nature or from imagination.



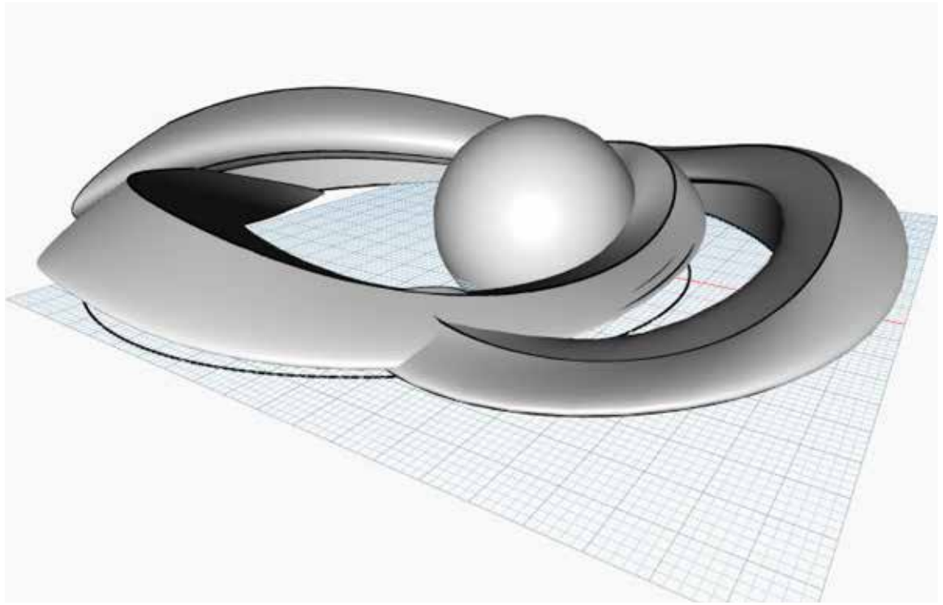


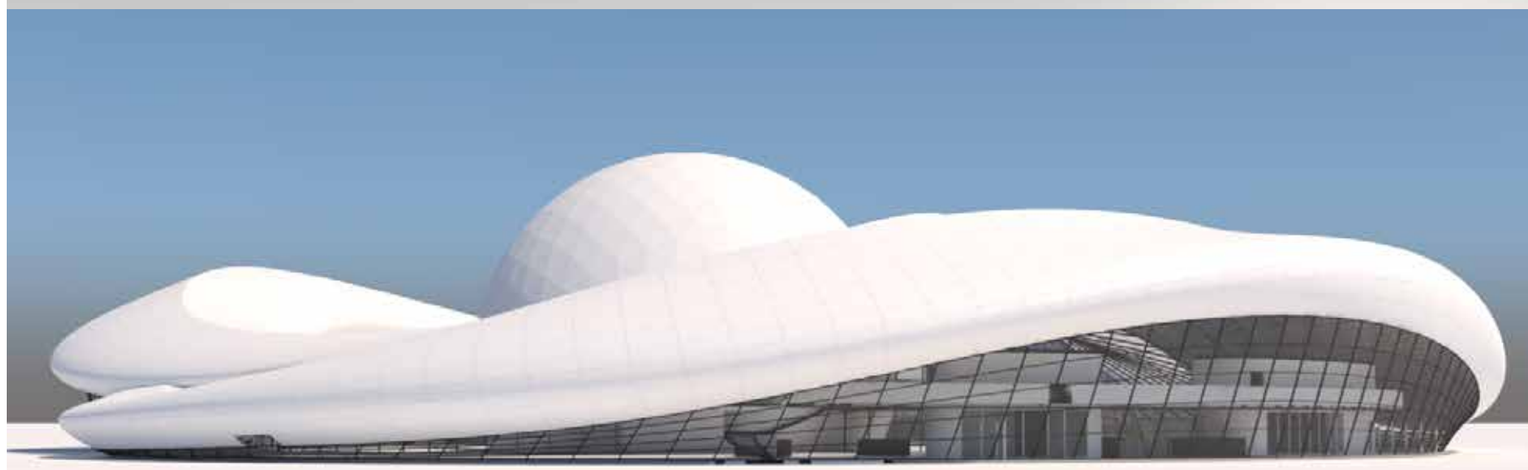
PLANETARIUM MASTER TESIS

During my studies at university in Cracow, I have met a professor that showed me the possibilities of coding in architecture. What allowed me to find my passions, and start to create amazing projects and shapes.

- TYPE: **PUBLIC BUILDING**
- AREA: **15500m²**
- PHASE: **UNIVERSITY CONCEPT DESIGN**
- LOCATION: **CRACOW, POLAND**

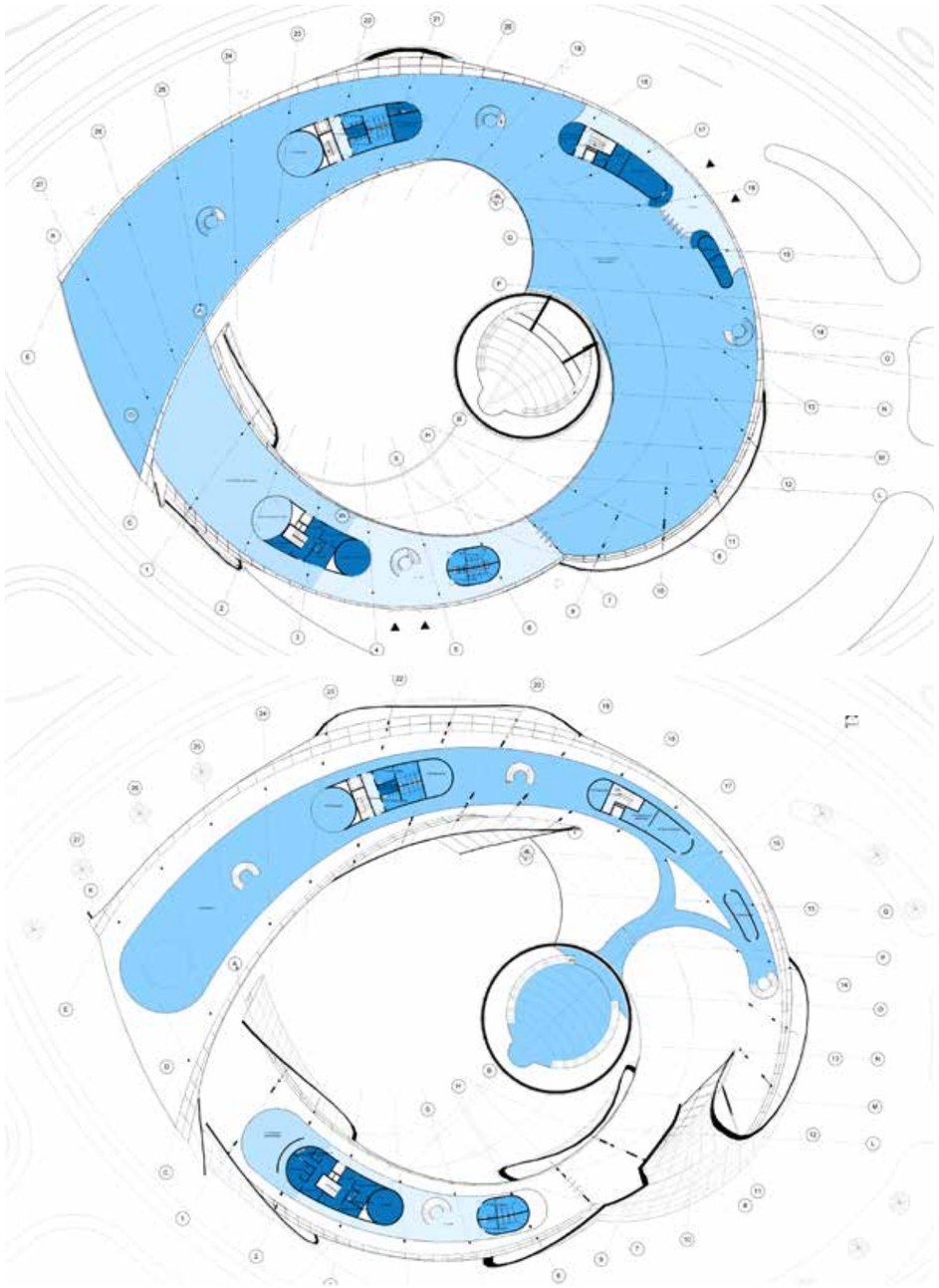
The project is showing possibilities of parametric modeling and using modern technologies in construction and visual effects. The main element of the project is a sphere where is possible to make projections all around. Thanks to that viewers can travel through the universe, being in the center of events. Roof, construction frame, and exterior glazing are designed by using Dynamo, which significantly increased the possibilities of form creation. The building is designed for 500 customers, who have available 100 parking spaces for cars and 8 parking bays for coaches. Planetarium perfectly fit in the environment of new offices and research centers.

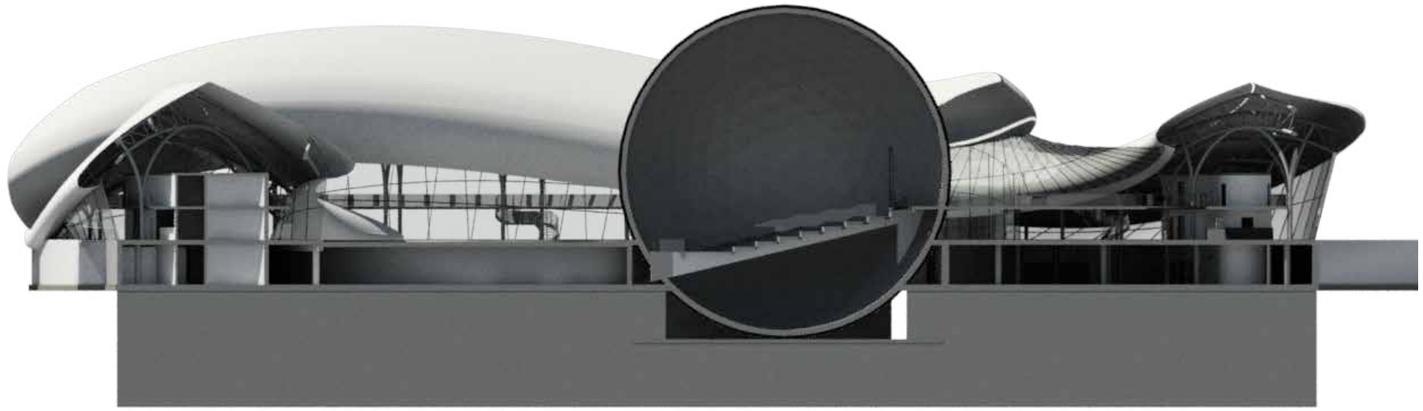


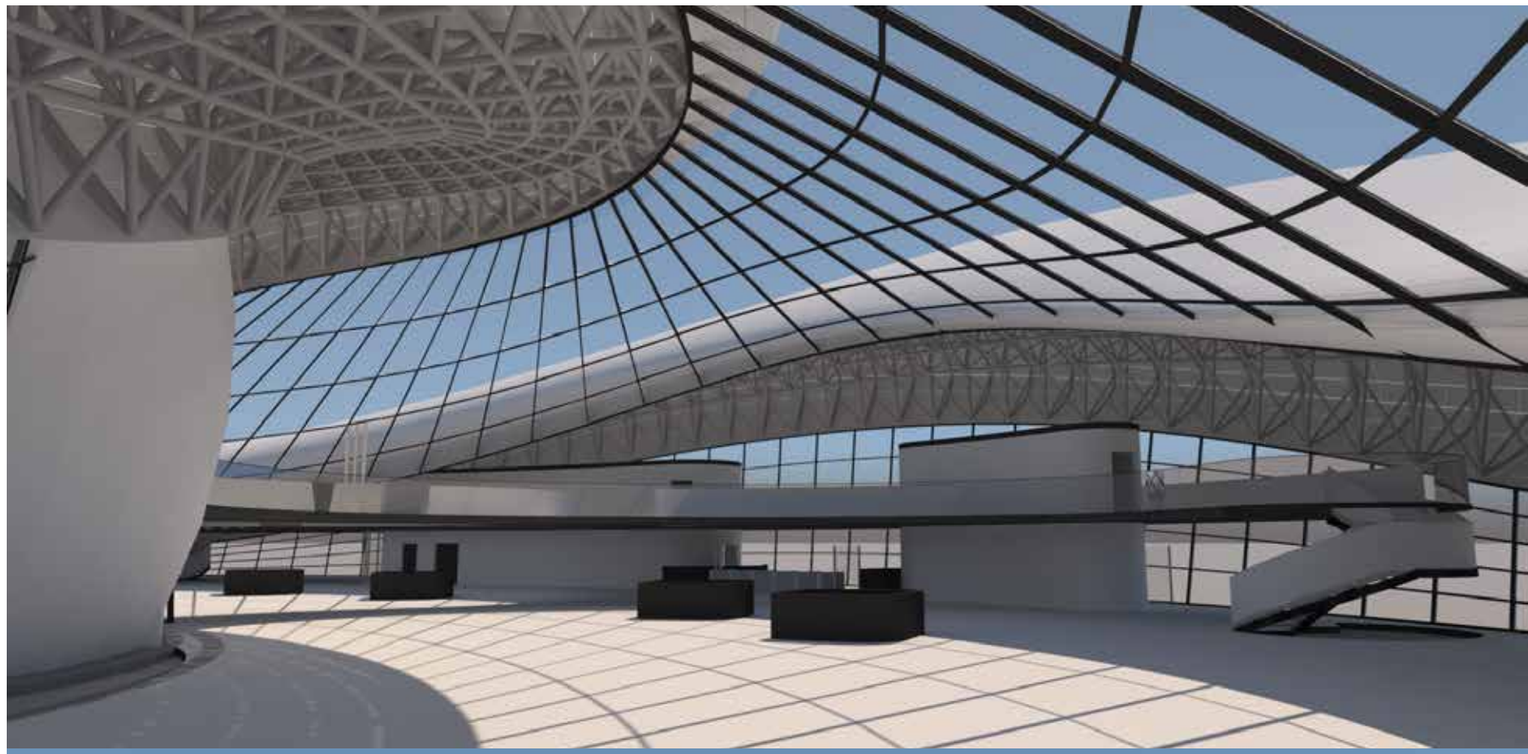


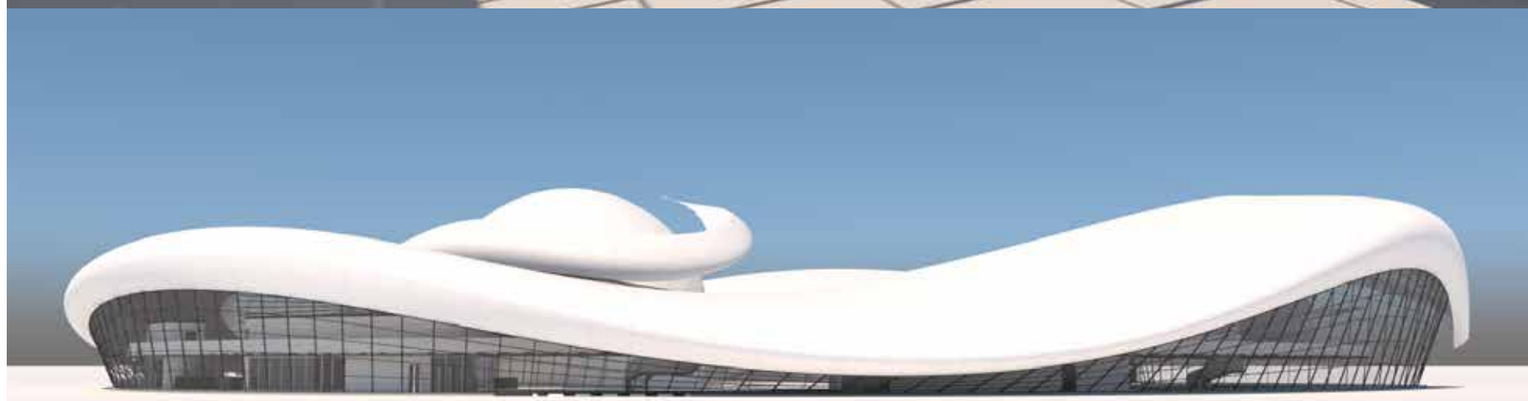
The main parts of the building as structural framing, roof, geosphere, exterior glazing (curtain wall), were generated or placed by Dynamo scripts. That gave me the possibility to easily manipulate the shape of the structure, amount of panel on the roof, or curtain walls by a simple change of parameters.

For such a complex shape it was needed to create my basic functions because built-in functions couldn't handle the tasks. Using coding languages for more than 12 years giving me ease of solving problems that cannot be solved by default functions of the software.









STRING ART

During the study in Cracow, I was a part of Egodrop Collective. We ware creating parties, but most important for me was creating STRING-ART sculptures with my friend and co-artist which are probably unique to these days.

As a Loop Collective, we were invited to many events around Poland. Our decorations could be also admired at business conferences and meetings. We were also taking part as a decoration in huge festivals in Poland, Germany and Czech Republic.

All our sculptures were bent manually, without using any machines, that were giving me an amazing feeling, playing with shape, creating decorations like no other in the world. Those shapes are inspiring me to design unique forms in architecture and learned me that I can go beyond the known limits.


Weltfrieden
YANNICK KROLL
MUSIC ART & PHOTOGRAPHY

Thank you for watching my portfolio and I am inviting you to contact me, I have much more to say about my passions and experience.

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