ID. BILKENT UNIVERSITY | DEPARTMENT OF ARCHITECTURE | 2017-2018 SPRING | ARCH 402 | ARCHITECTURAL DESIGN VI | SECTION 4

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Section 3- Segah Sak
Section 4- Yiğit Acar

Design and Editing / Tasarım ve Düzenleme:
Yiğit Acar

I'd like to thank to all my students who were honest and hardworking throughout the semester. It was a joy working with them.

Members of Section 4

Candan Budak, Çisem Bozbek, Damla Tarman, Demre Ertem, Derin Şen, Fatma Betül Güreş, Günsü Dilara Demirtaş, Halime Kızıl, İpek Topalkara, Melis Erdem, Merve Yüksel, Sezgi Kırkın, Zumrud Nabiyeva

Instructor:
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PROJECT BRIEF

Ihsan Doğramacı
Bilkent University
Department of Architecture

Arch 402:
Architectural Design VI

2018 Spring Instructors:
Mark Frederickson
Jesus Espinoza
Yiğit Acar
Segah Sak

Ankara is changing rapidly and beset with developmental issues involving growth, sprawl, economic stagnation and stratification, a dearth of open space, congested transport, environmental degradation, as well as socio-cultural isolation. In our continuing search for "sustainable" design and planning solutions, we must consider an array of urban issues. Pedagogically, this project offers us an excellent opportunity to expose students to complex, multifaceted, real-world professional experiences. Many urban mobility, infrastructural and open space deficiencies throughout the city are being identified and discussed. This studio team will collaboratively generate, explore and synthesize alternative urban and site specific architectural concepts that address the creation of a sustainable and livable urban fabric. The project will focus on the development of a sustainable campus extension near and around the existing campus lake watershed basin. Connectivity to the campus as well as to the growing mixed-use development to the North, (Bilkent Center, new office and condominium complexes) is a central issue of the design problem.

This development will offer emerging Ankara a sustainable urban prototype, as well as provide Bilkent University research facilities in all fields of study related to sustainability. Its design and infrastructure will highlight advances in sustainability i.e. net zero architecture, urban fabric that embraces the principles of smart growth, alternative sources of energy, urban agriculture, water conservation and purification strategies, wildlife and watershed basin conservation and remediation, etc. The site's importance as a potential catalyst in the development of a collaborative research center as well as a sustainable urban prototype in the reimaging of Bilkent University's campus fabric, its economic potential, scale, and proximity to potential interconnected greenways suggest vast potential, both in terms of the scale of and variety of design and planning interventions possible. The studio will expose students to urban sustainability and community revitalization theory and application as well as the design and development of complex architectural interventions within said sustainable master plan. It will also discuss the implementation of Architectural, Landscape Architectural and Planning strategies in urban design and community development. The studio's collaborative environment will be modeled on several of the more successful international design and planning firms' management policies and design methodologies. Seminar-style lectures will be coordinated with immediate opportunities to apply the information in the design studio environment.

Students will alternatively work collaboratively on master planning tasks as well as individually on specific architectural projects of their choice. This semester we will be working with an array of specialists to examine both the campus watershed basin and it's surrounding urban context. We will be looking for opportunities to promote sustainable development in these areas – ecological revitalization, walkable urban environments intermixed with intelligent open space and mixed use

infill strategies. This semester we have the opportunity to generate a series of alternative master planning concepts for this campus waterfront area. We will be working through a range of scales from urban, to neighborhood, to site specific focus areas and architectural designs.
Projects of this sort have importance to a variety of user groups and our solutions could potentially have significant impact on surrounding social and environmental contexts. This studio will therefore devote itself to generating sustainable design and planning alternatives appropriate to the campus and to Ankara.

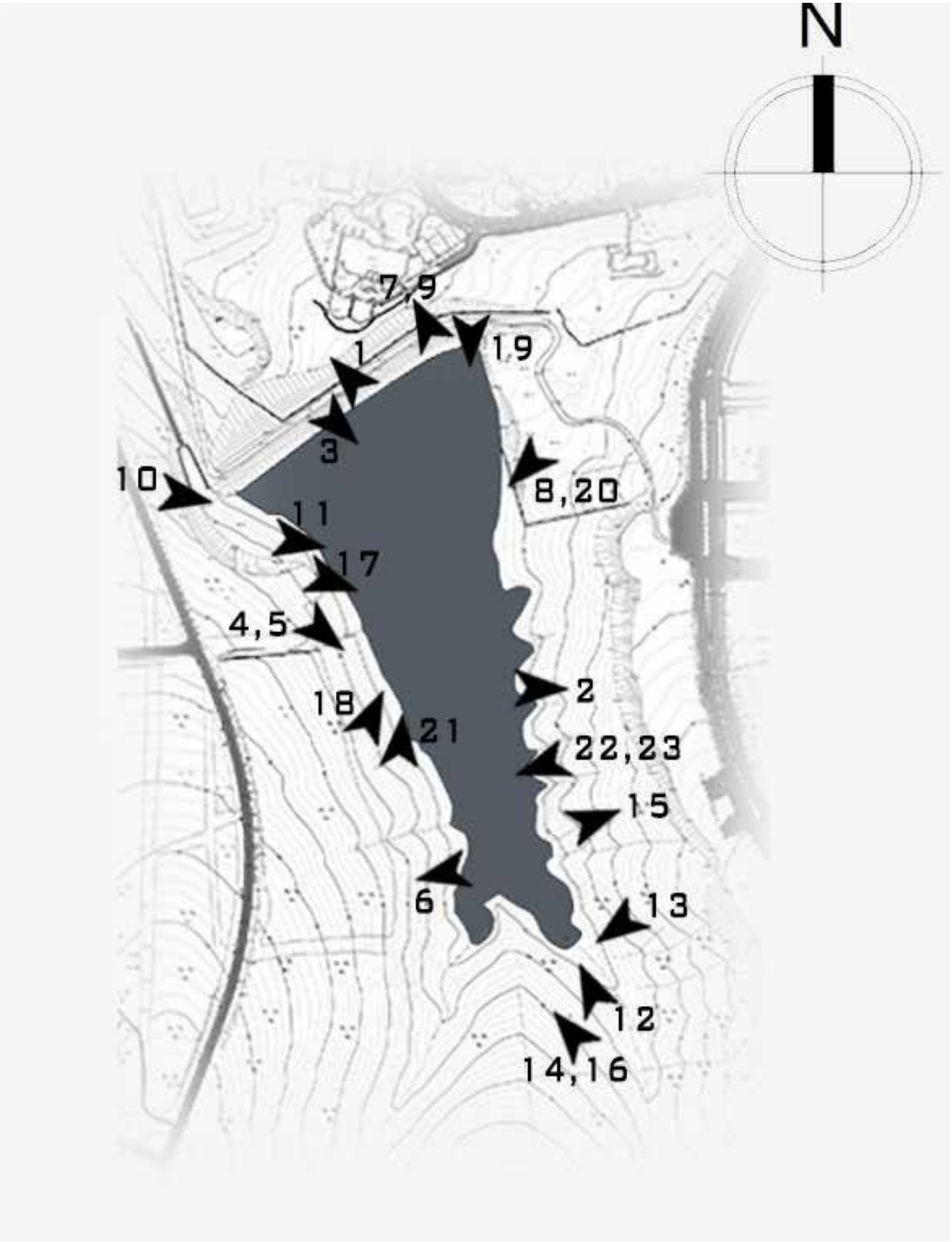
Simply stated, we have an opportunity to demonstrate how a variety of planning and design strategies can encourage intelligent development within the existing infrastructure of our campus, thereby contesting wasteful urban sprawl. Although we should remain apprehensive regarding the use of the term "sustainability", we will honor it as an elusive yet worthy goal integrated into all our planning and design efforts. It is likely that a truly sustainable urban environment must necessarily be defined across an array of dimensions: economic, cultural, environmental, functional, aesthetic, etc. Accordingly, in complex projects we evaluate the relative merit of our ideas per the following design and planning ordering systems: Economy; is the design economically sustainable? Does it create jobs and income sources for the community? Environment; is the design environmentally sensitive? Does it connect and enhance existing ecosystems? Does it reduce our carbon footprint? Culture; does the design create opportunities for meaningful social exchange and learning? Function; does the design circulate effectively? Is it safe? Is it easily maintained? Aesthetic; has the design identified and created an aesthetic sensibility appropriate to the history and culture of the region and its vision of the future? These systems can become a form of checklist deeply embedded in a design process, and an idea's relevance and usefulness increases according to the number of different ordering systems that it engages. For instance, an idea that concerns itself with only aesthetic issues is not as useful as an idea that fully engages not only spatial and image-related issues, but also explores economic, environmental and social issues as well. A park with flowers is fine, but a park with flowers that meanders its way through a community increasing land values, creating economic opportunities, mitigating erosion, promoting urban water harvesting and encouraging meaningful social interaction is a richer, more layered and therefore more relevant concept and eventual urban component. We will use these invariably interconnected systems as a means of verifying the relevance of our ideas. Our solutions must be multi-layered and satisfy the complex range of design determinants present in all urban settings. Over the years, we have come to understand and appreciate that these design and planning strategies have the ability to encourage meaningful transformation in urban environments. These ordering systems have in turn, become one definition of sustainability.

Essential learning modules contained within the structure of this semester will focus on the application of the principles and fundamentals of both architectural and landscape architectural design in complex urban design and revitalization situations. Emphasis will be placed on design, design process, design synthesis, and digital, graphic, verbal and written communication. The design process module will focus on a variety of ordering systems. These will be continually engaged throughout the data collection, data analysis and design synthesis phases of design. At all levels of the design process ordering systems will inform the decision-making process.

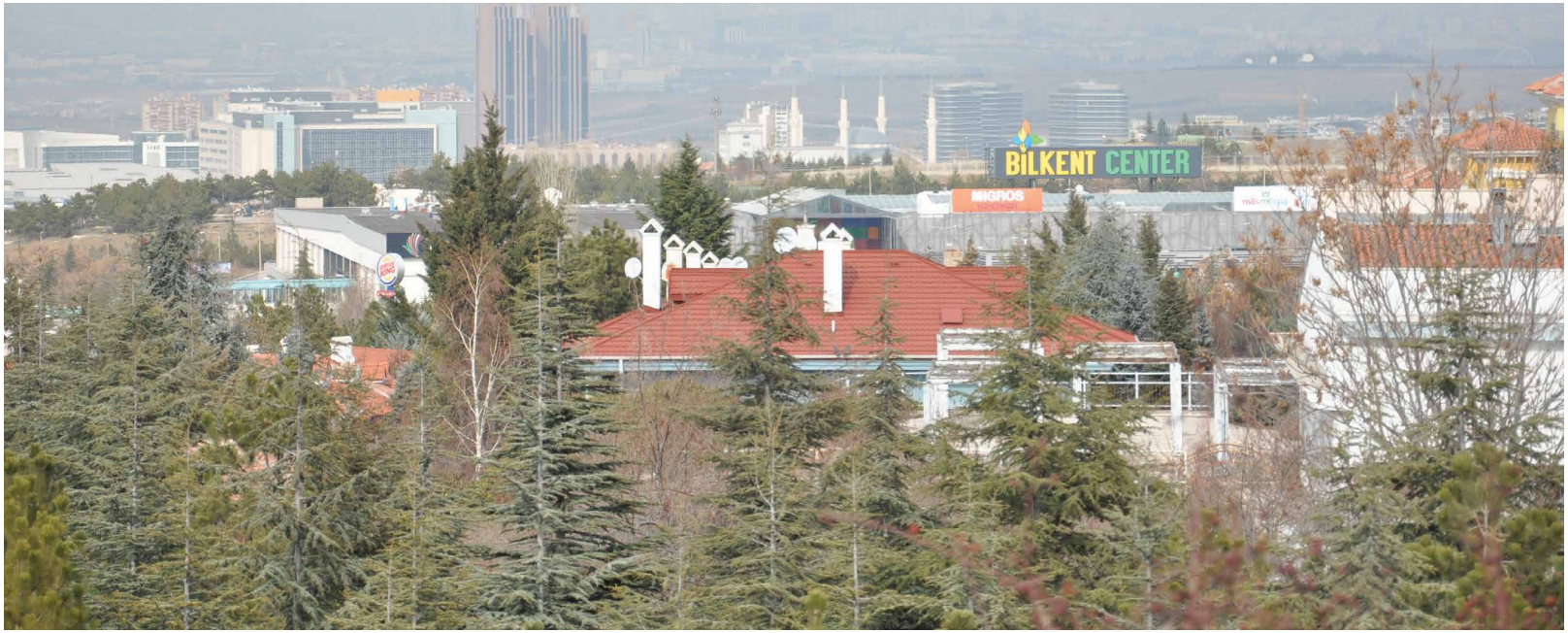
SITE RESEARCH

1.1

SITE VISUALS



Site Map Showing the Photograph Locations



General View from above the Dam

Photograph #7-8
Photograph #1

Tree Color Detail

Photograph #2

General View

Photograph #3

Plants and their relationship with water

Photograph #4,5,6

Waterbody w'th rock and plant details with reflection of the sun

Photograph #8

Fallen leaves and water body.

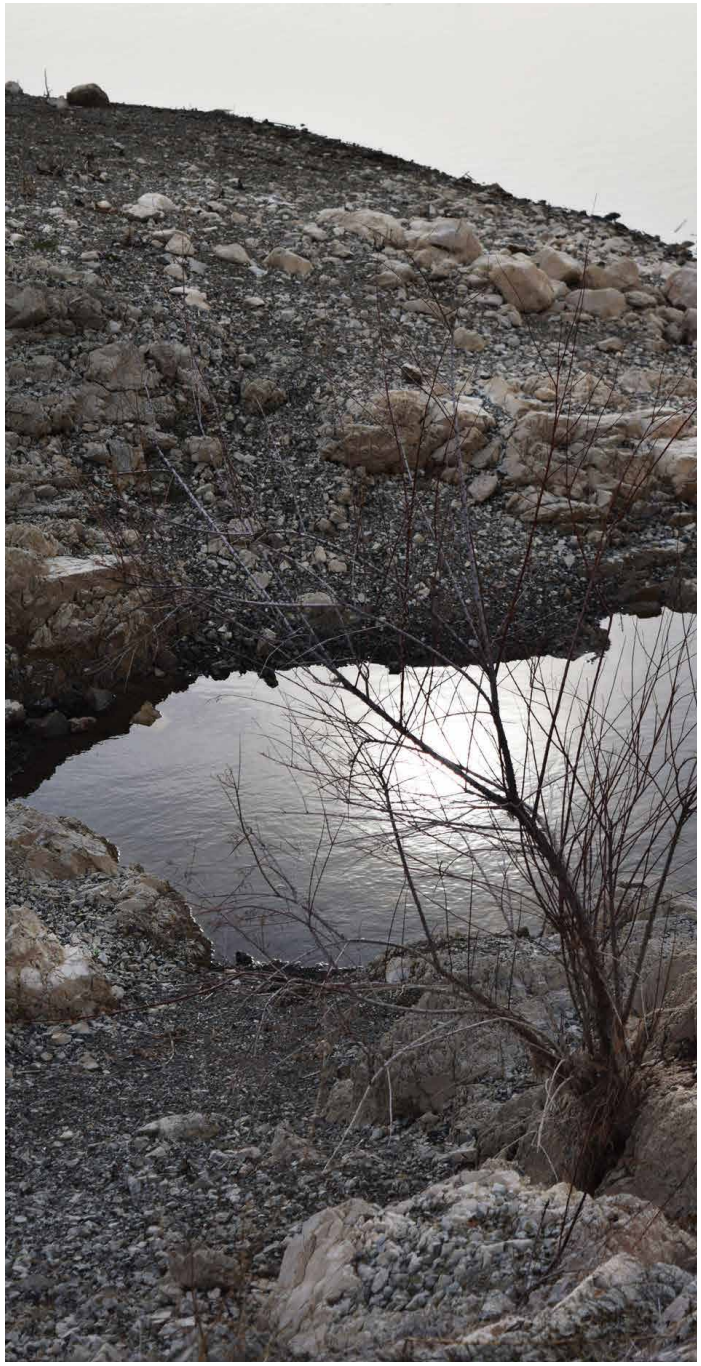
Photograph #16

General view of the site.

Photograph #17

General view of the site.

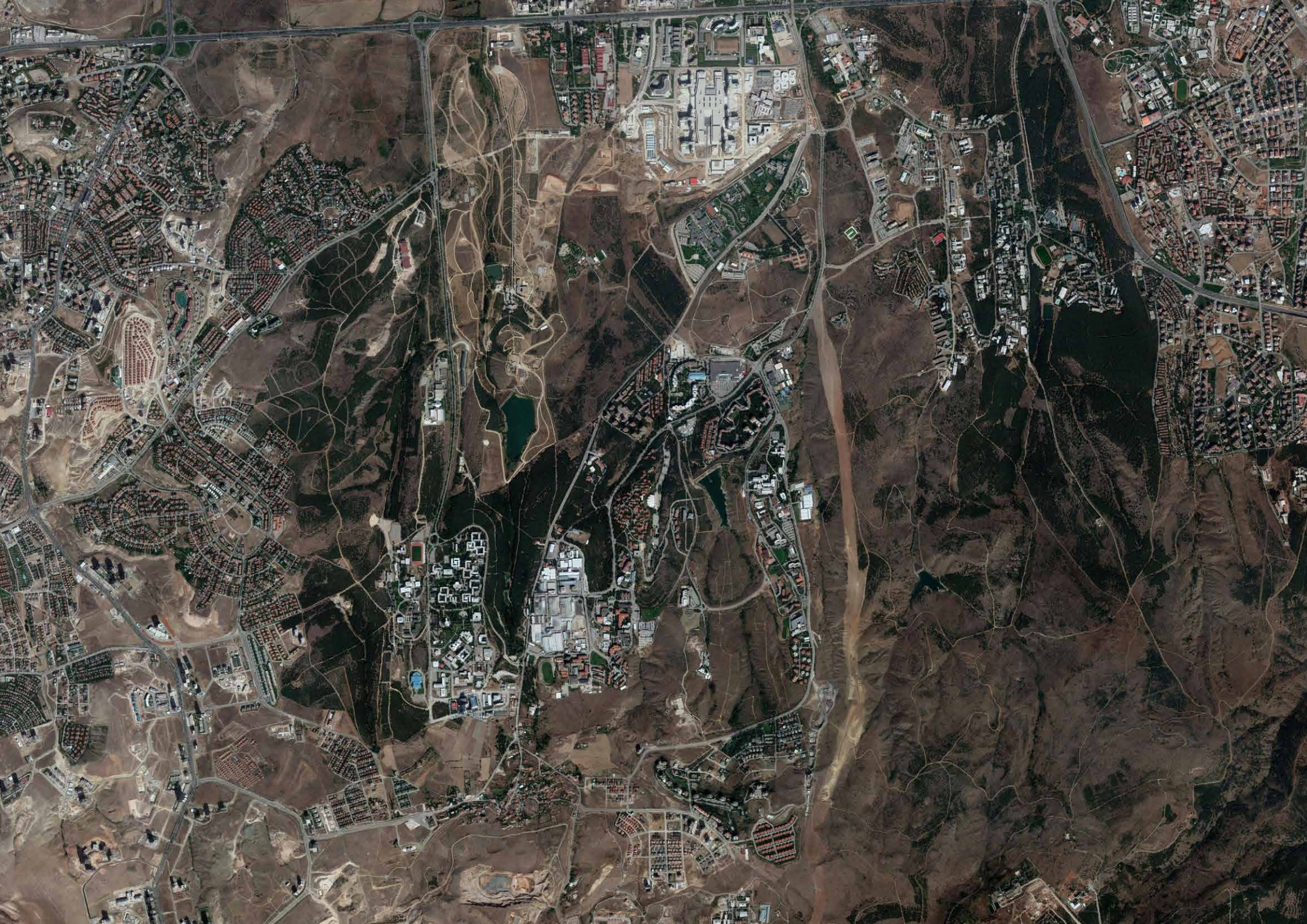
Photograph #19



Site details.

Photograph #23,24

Overall site panaromic.



TYPES of GREENERY in URBAN CONTEXT

TYPES of GREENERY and WATER STRUCTURE

RECENTLY PLANTED AREAS
ACTIVE GREEN SPACES
BILKENT POND
WOODLANDS
EXISTING BUILDINGS

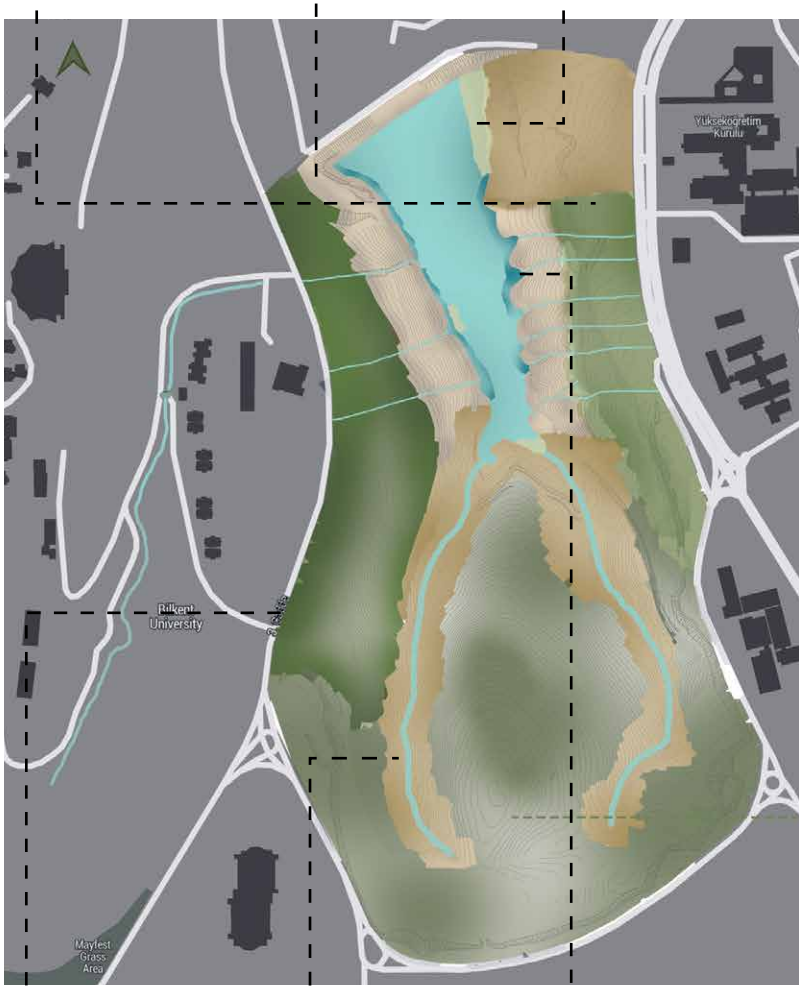
BILKENT POND
NON CONT. WATER CH.
OVERFLOW CH.
CONT. WATER CH.
CHANNEL
DAM

TYPES of VEGETATION and SOIL TYPES

SMALL PINE TREES

STEPPE

REEDS

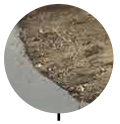


BIG PINE TREES

RIPARIAN AREAS

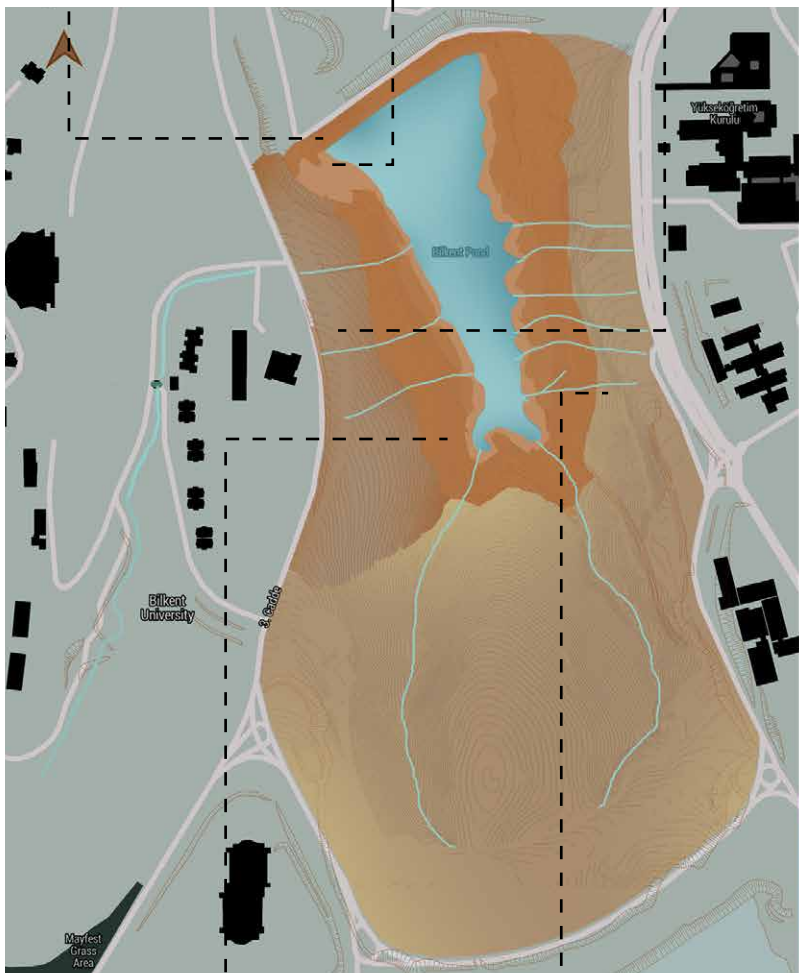
HYDROPHYTIC PLANTS

HARD-ROCKY SURFACE



SANDY SOIL

WOODLANDS



ERODIBLE SURFACE

SMALL TREES

PHASES of URBAN DEVELOPMENT

1984

Bilkent Established

1990

Construction of Residential Areas

2004

New Road from Main to East Campus
Atatürk Hospital Constructed

2016

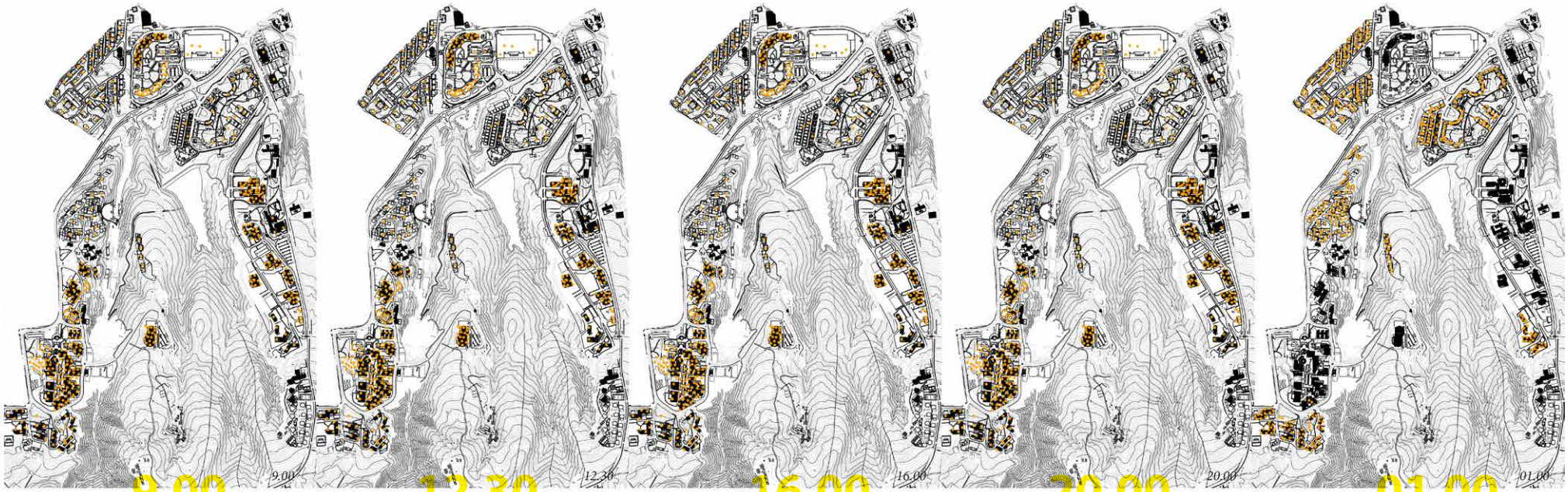
Construction of City Hospital
Constrution of Metu Road

CULTURAL FACILITIES

CAMPUS ACTIVITIES	BILKENT MIDDLE CAMPUS	BILKENT MAIN CAMPUS	BILKENT EAST CAMPUS	BILKENT CENTER
Cafe & Restaurant	1	7	3	20
Cinema, Bowling etc.	---	---	---	1
Performing Art	2	---	---	---
Gathering Places	---	2	1	---
Green Areas	---	2	1	---
Tennis Courts and Footboall Fields	---	5	3	1
Outdoor Sport Facilities	---	---	---	---
Indoor Sport Facilities	---	2	1	1
Starbucks	---	2	---	3

EXISTING AND POSSIBLE

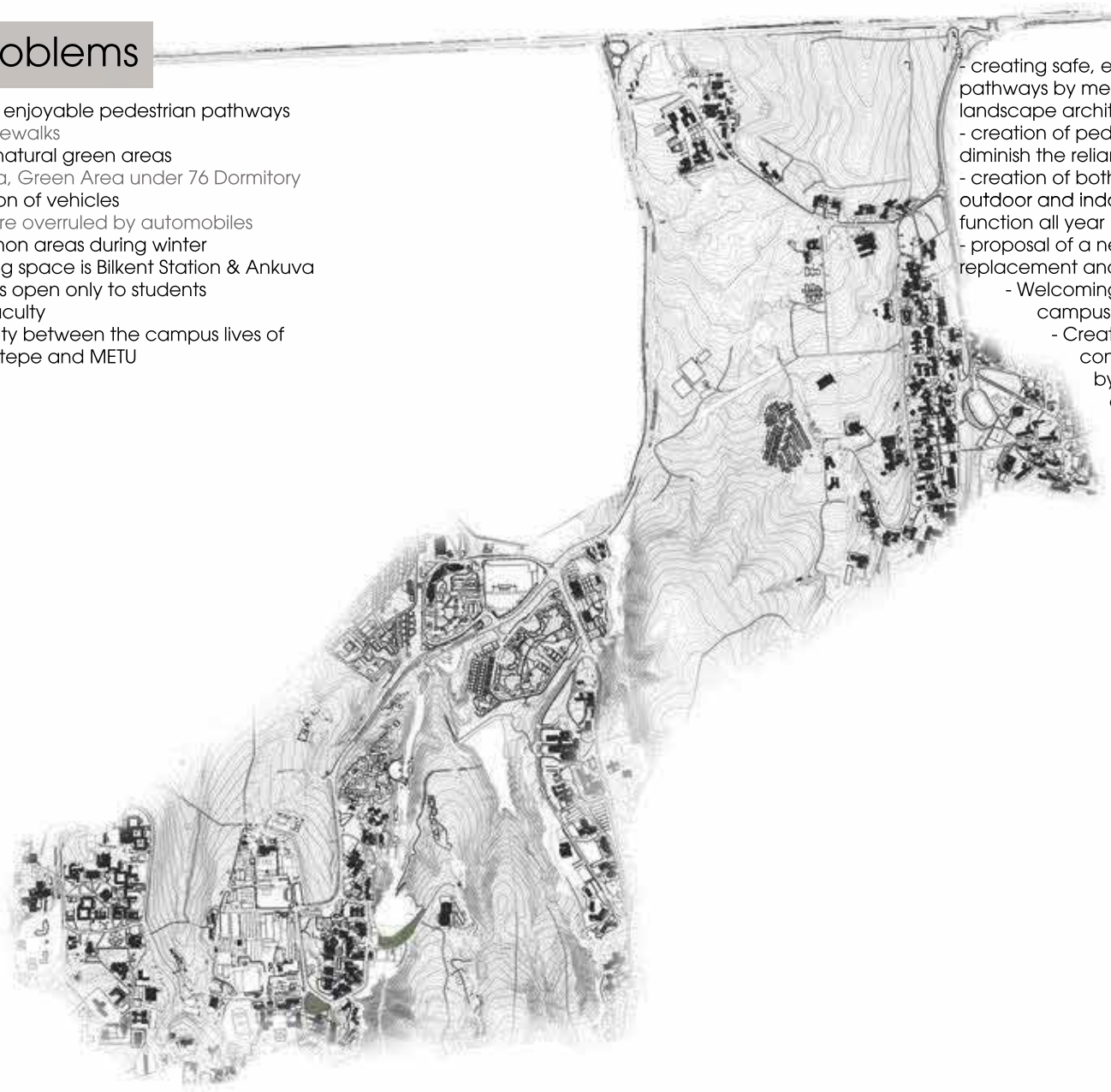
USER DENSITY over TIME



REVIEW of SOCIO-CULTURAL ASPECT

Problems

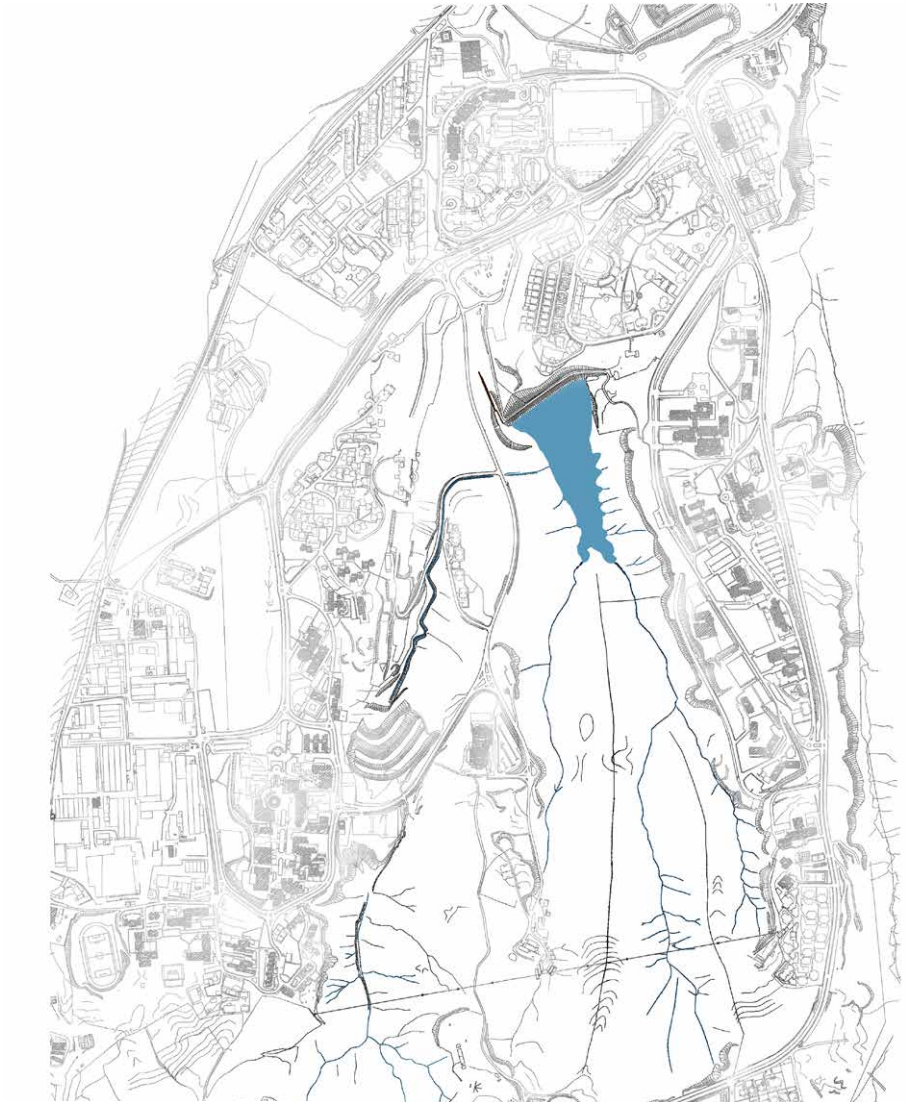
- lack of safe & enjoyable pedestrian pathways
  Mainly all sidewalks
- Isolated & unnatural green areas
  Mayfest Area, Green Area under 76 Dormitory
- Overpopulation of vehicles
  Pedestrians are overruled by automobiles
- Lack of common areas during winter
- Main gathering space is Bilkent Station & Ankuva
- Campus doors open only to students & academic faculty
- No connectivity between the campus lives of Bilkent, Haccettepe and METU



- creating safe, enjoyable pathways by means of landscape architecture
- creation of pedestrian pathways that could diminish the reliance on vehicles
- creation of both outdoor and indoor common areas that could function all year round
- proposal of a new central gathering space as a replacement and development of Bilkent Station
- Welcoming people from outside of the campus
- Creating both direct and social connections between the universities by means of pathways and proposal of new activities and spaces that can be shared by all three campuses

Opportunities

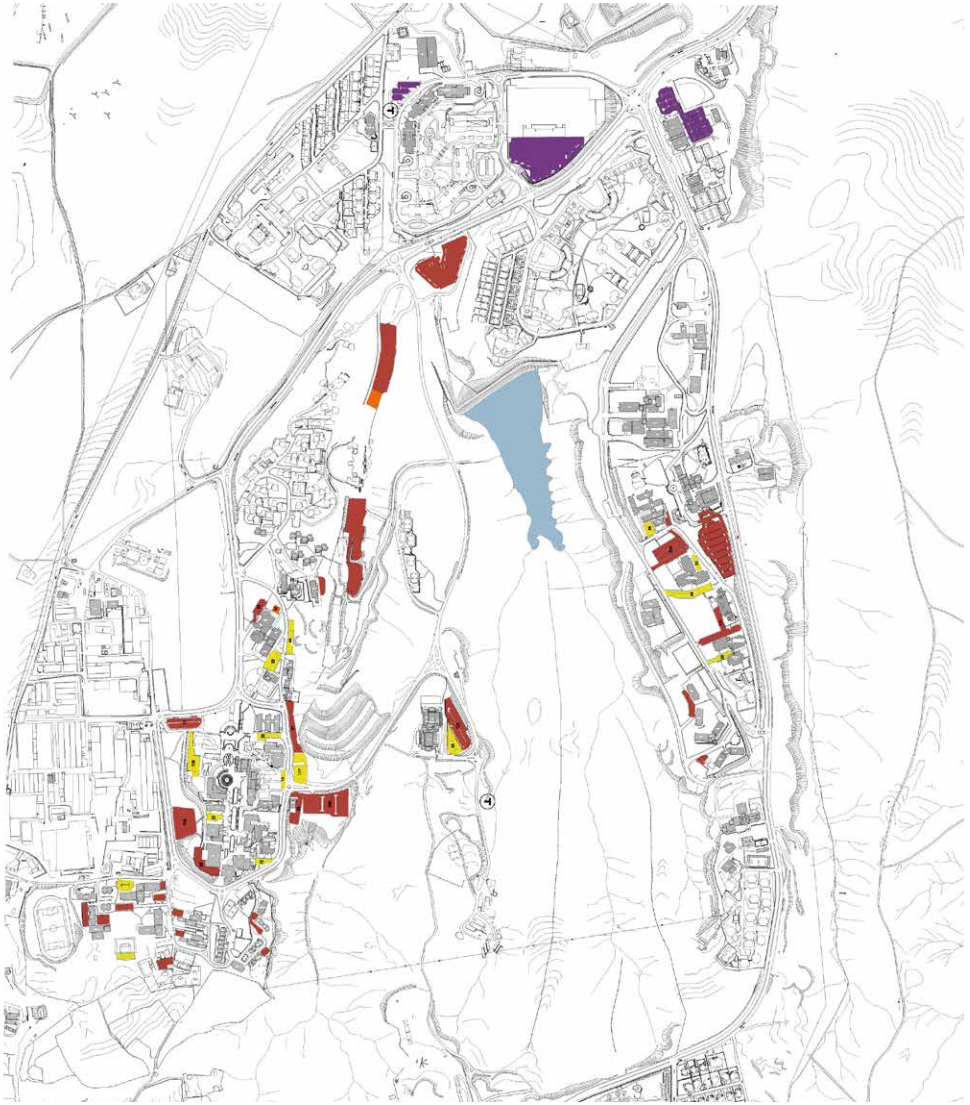
WATER STRUCTURE and PARKING INFRASTRUCTURE



Watershed

Rainwater Channel

Bilkent Pond



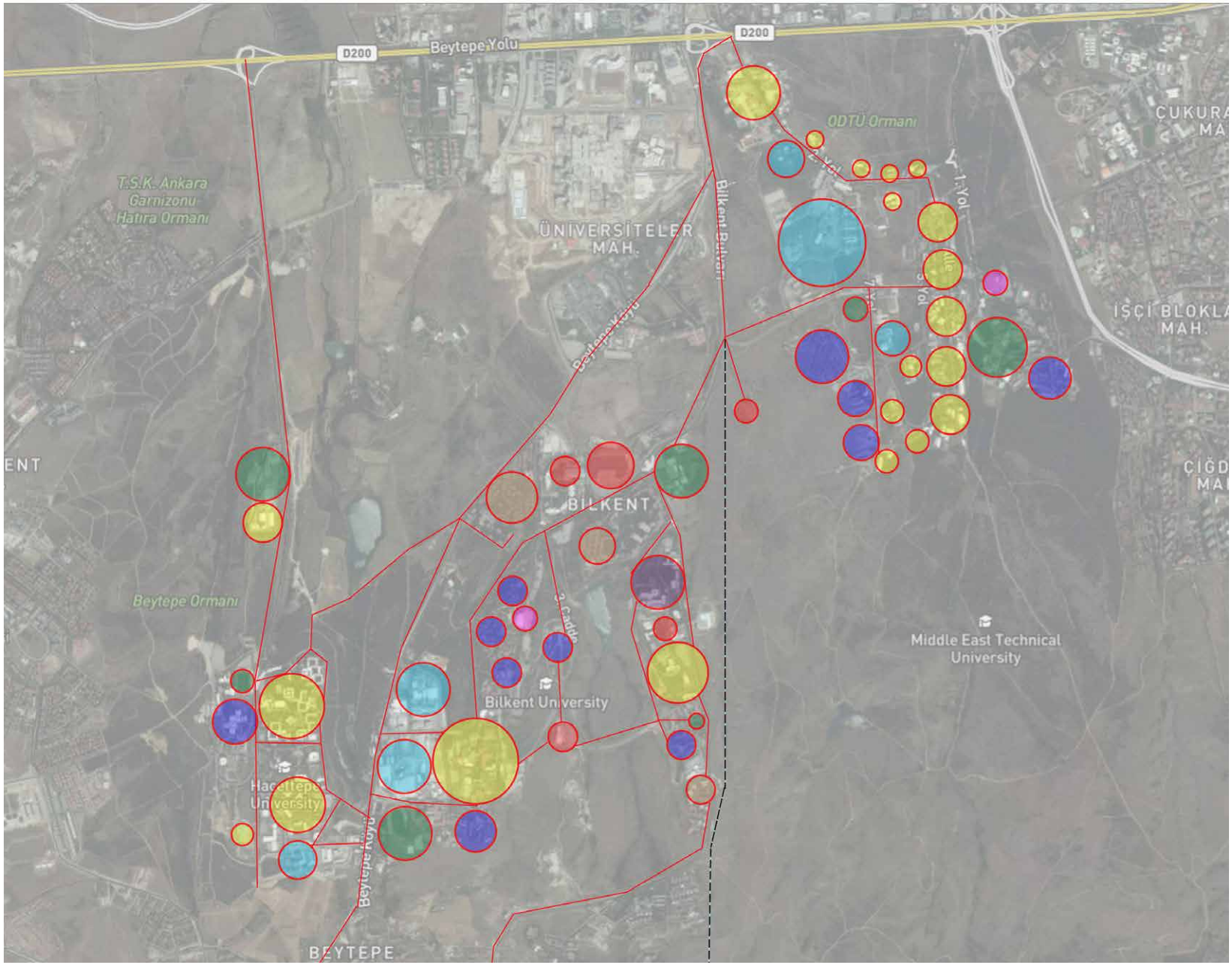
Academic Only

Mixed

Off Campus

ROAD STRUCTURE

FUNCTIONAL STRUCTURE of THREE CAMPUSES



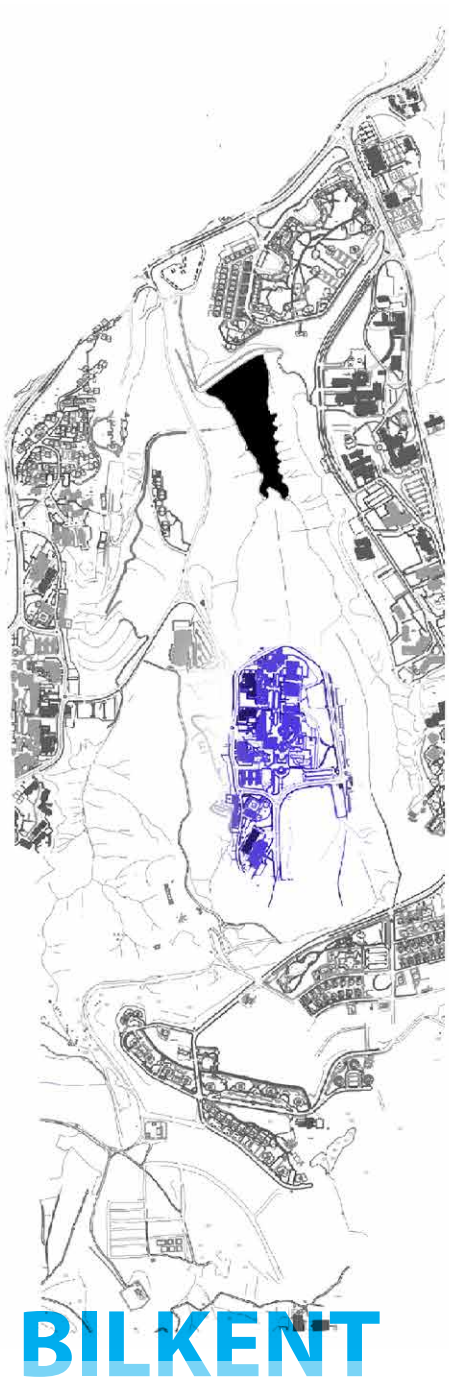
- Faculty Buildings
- Institutes
- Technoparks
- Student Accomodation
- Commercial
- Residential
- Sports
- Odeon

USER COUNTS in the URBAN CONTEXT

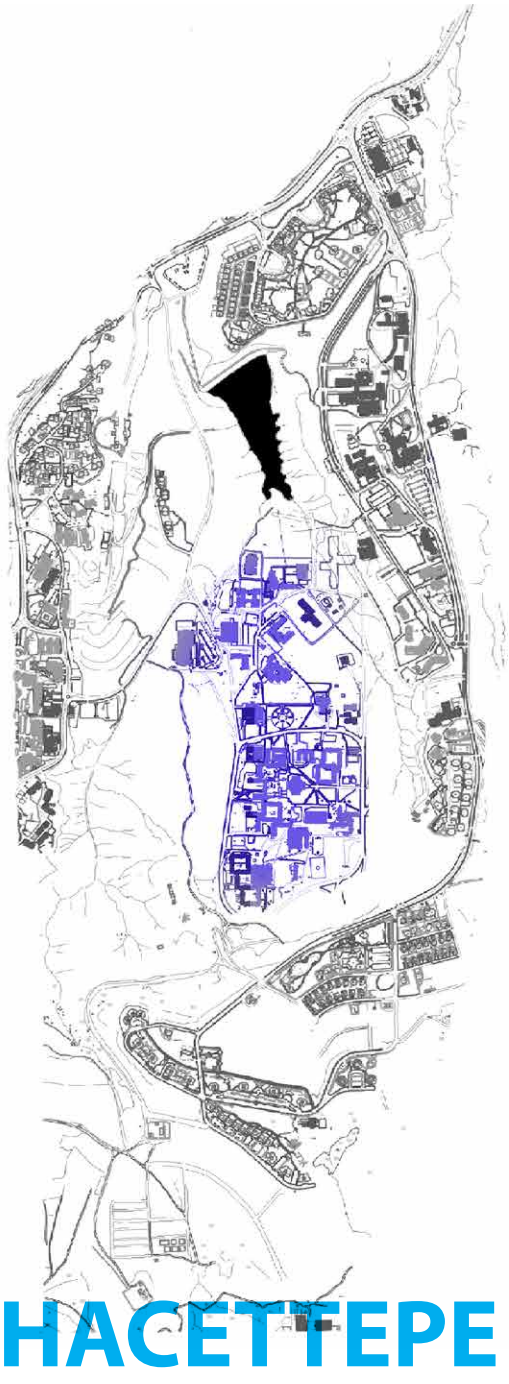
KENTPARK
242000 m²
NUMBER of SHOPS 204

CEPA
NUMBER of SHOPS > 200
3800 PARKING LOTS

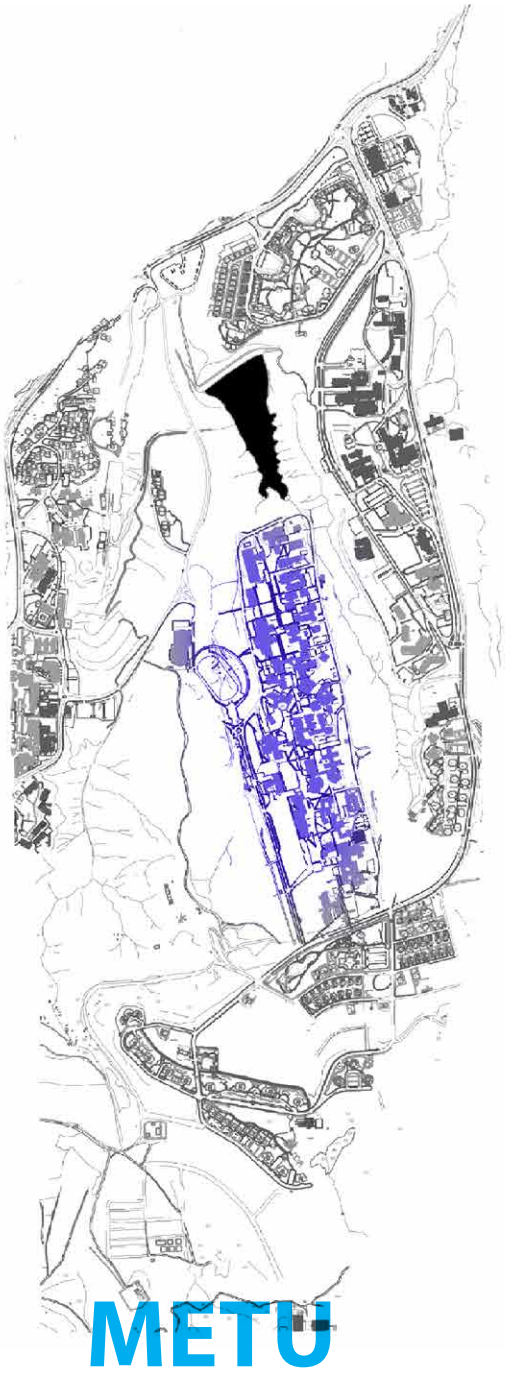
SCALE COMPARISON



BILKENT

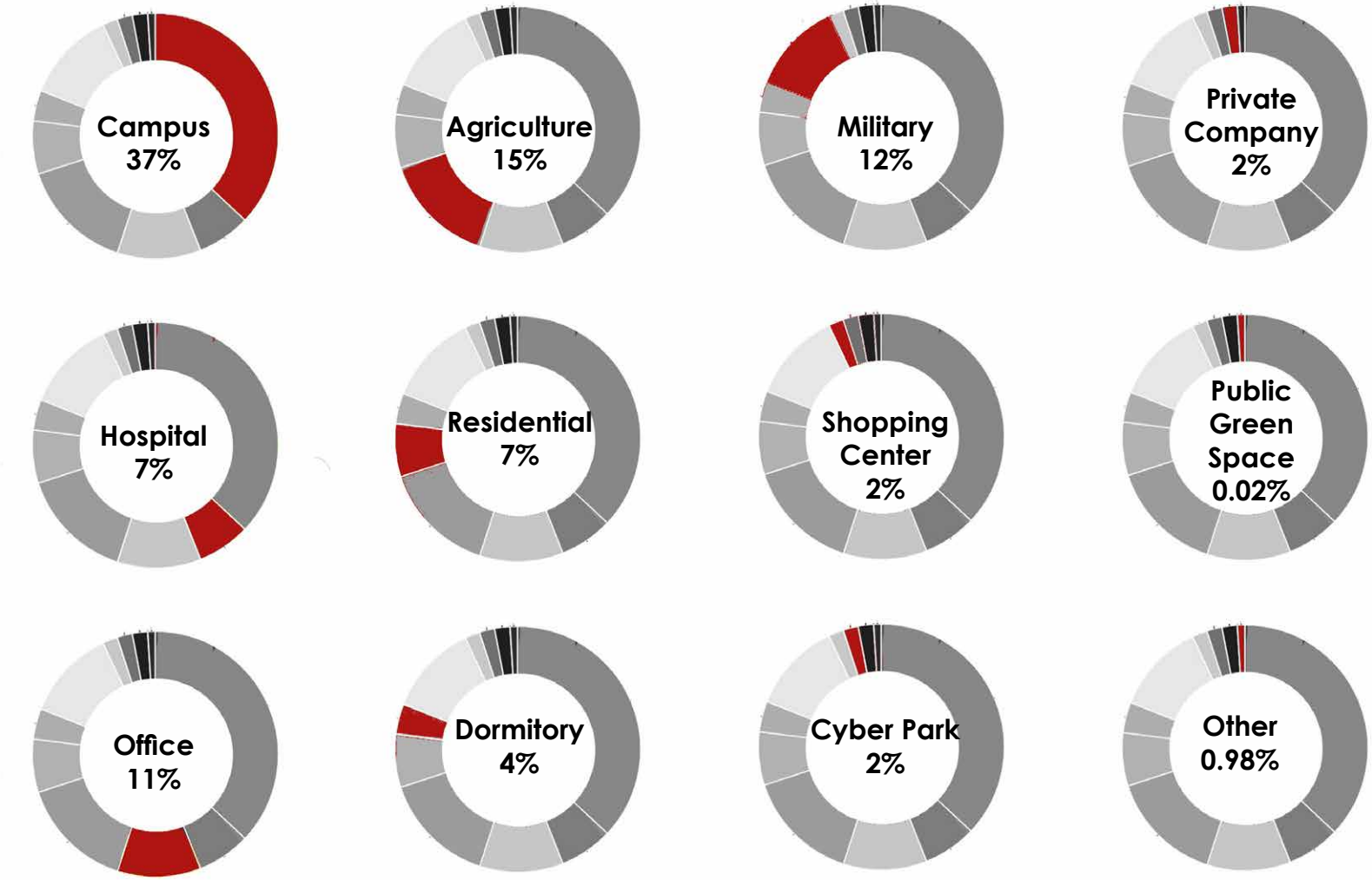


HACETTEPE



METU

DISTRIBUTION of FUNCTIONS in BILKENT AREA

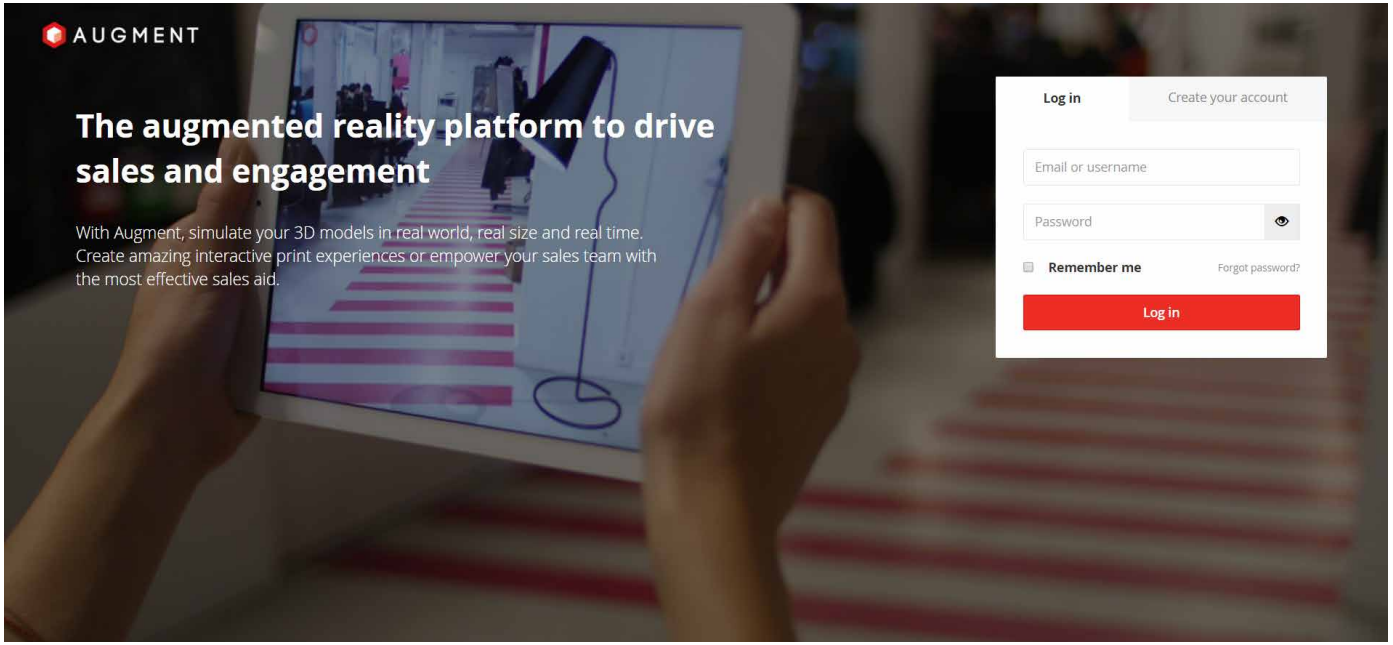


AUGMENTED REALITY

In this part, considering the high costs of producing a physical model, a virtual model was aimed to be produced. This model will also have a scale depending on the desired context. There are various websites and apps providing augmented reality service.

In the following pages, a tutorial on Augment app and another on Roar were introduced. Below is a chart of the applications that were researched; comparing and contrasting the features that they have.

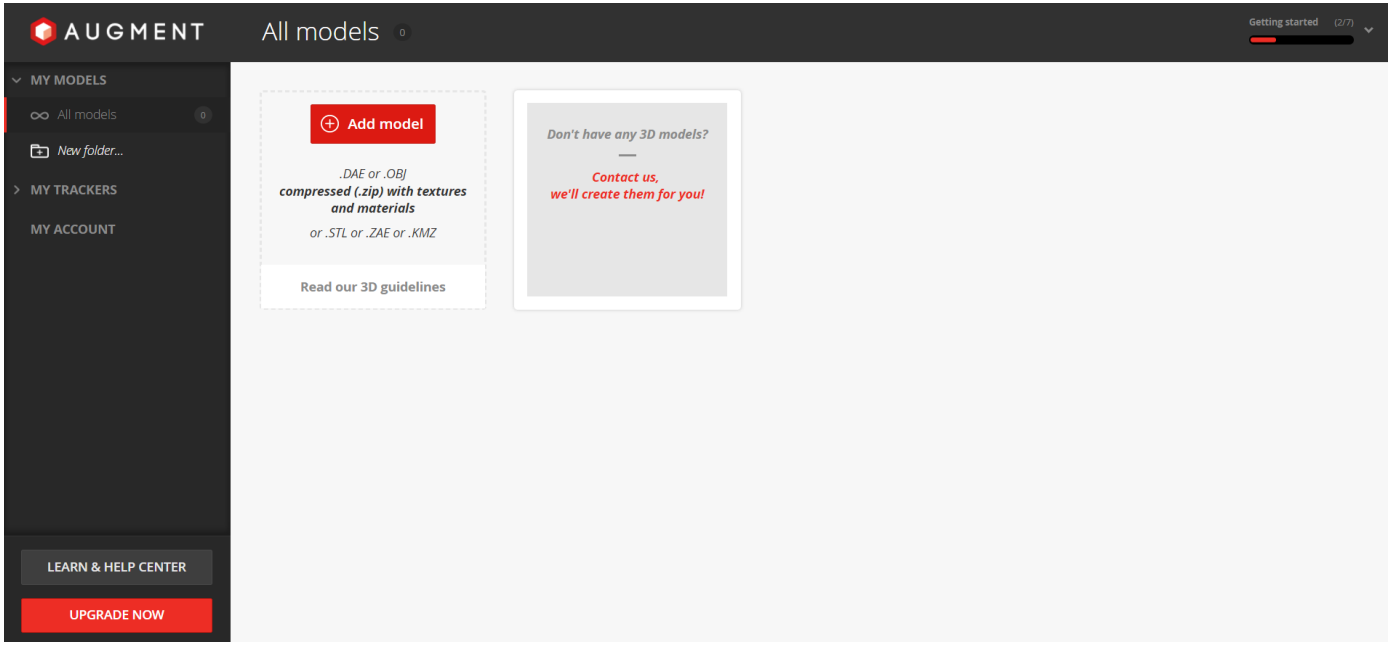
	Free	OS	Publishing	Size Limit	Easy to Use
AUGMENT	*1 year free student licence or 14 days trial*	*android/ios*	✓	—	✓
ROAR	✓	*android/ios*	✓	*10 MB*	✓
unity	✓	*android/ios*	*requires USB cable*	—	—
SMARTREALITY	—	*android/ios*	✓	—	✓



AUGMENT

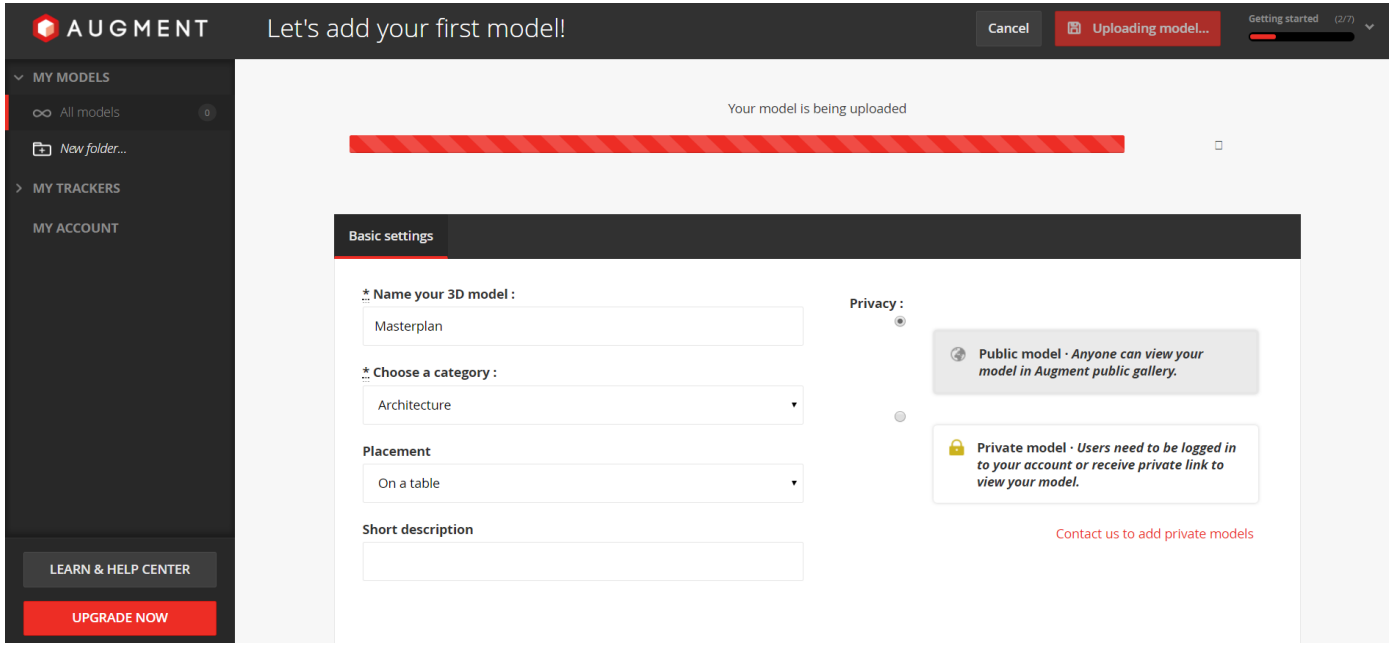
Step by Step

Logging in is the first step to use the website.

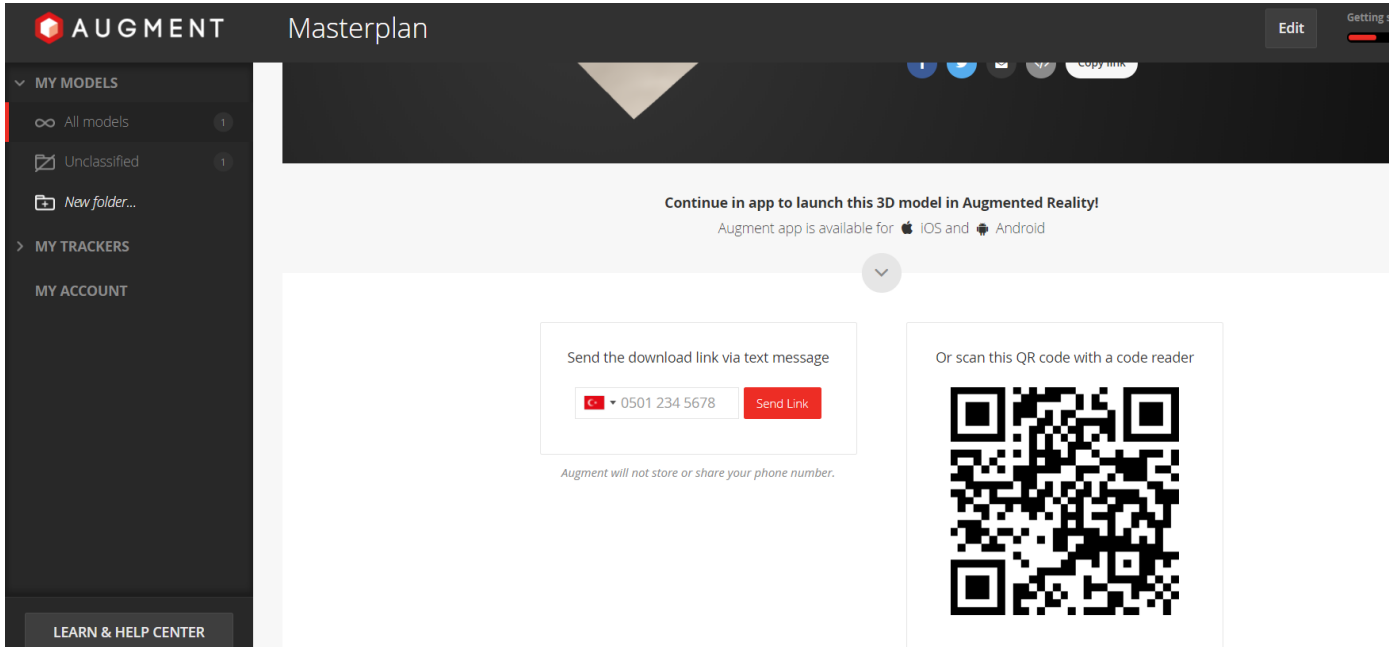


By clicking "Add Model" option, a .zip file containing .obj or .dae model and a material file should be uploded.

In the next page, the model should be categorized during upload.



After the model is processed, it can be seen through a download link sent to mobile phone or a QR code that can be scanned via Augment app.



DRONE FOOTAGE and AUGMENT MODEL of the SITE

Scan with AUGMENT app to view the site model in 3D

Scan with any QR code scanner for drone footage.
source: http://dronemap.info/

THEORY REVIEW

1.2

At the same time with the analysis work, we also held seminar sessions where each participant reviewed a paper and informed their colegues about the content. 13 papers were selected covering a wide array of topics; planning and urban history of Ankara, landscape memory, social aspects of the city, emerging issues in urbanism, ecological maintanence, architectural program and technologies.

MODERNIST LANDSCAPES of ANKARA

Review by: Derin Şen

The paper mentions that the development of modernist landscape ideology during the early Republican Era in Turkey, and the detailed modernist design ideas for Ankara by architect Hermann Jansen. It demonstrate the interaction between Herman Jansen's social and landscape ideas and the Anatolian landscapes after the First World War. As conclusion it defends the value of modernist landscapes of Ankara as a part of the urban collective memory in Turkey and the modernist cultural heritage.

At the end of the First World War, Kemalist revolutionaries relocated to Ankara during the war of independence. The Kemalist revolution aimed to adopt the aesthetic culture of high modernism in arts and architecture. Therefore, the landscapes of Ankara become an experimental field of Turkish nation-building and modernization. After the Turkish-German friendship agreement established, the Turkish government organized a project competition to produce a holistic city plan for Ankara with three participants. The architect and planner Herman Jansen's plan stood the most eligible proposal. His intention was emphasize the Ankara castle as the symbolic container of the Independence war, and to bring his holistic and modernist perspective on the landscapes.

After giving this story behind the new planning of the city, the paper mentions about the intellectual background of Jansen's landscape thinking. The concepts of ecology and sociobiological self-sufficiency were an inevitable part of modernist German landscape architecture. There should be a unity between the nature and culture. The idea was to protect the natural world with issues of national identity and memory. The landscape plan by Jansen for Ankara included functional zones, regular geometry, bigger lots, sport areas, parks, public spaces, green areas, wide streets, paths, and nodes stitching together the new monuments and cultural buildings of the nation-state. The city plan followed the topography of the city. To create the 'green Ankara', he proposed protecting all the important natural features in the city that influenced the urban morphology and established the open-space system. The plan included a system of free spaces to enrich the social and symbolic functions of the city. He believed that these spaces would enrich the social and symbolic functions of the city. After that the paper explains his design decisions in detail of some parts of the new city plan such as Samanpazarı Square, Youth Park, Central Stadium, Workers Quarter, and Bahçeli Evler Housing Cooperative. His intention was generally create diagonal green stripes that connects spaces together, enables citizens to move everywhere in the city on foot in a natural corridor. He suggested certain placement angles for gardens in between buildings masses in order to provide sun to all houses. At the center of complexes, he create open spaces such as play plaza, swimming pool, tennis court, market plaza, school courtyard and panoramic terraces.

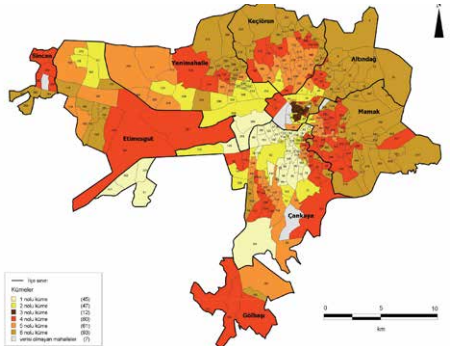
Despite all the economic, social and physical limitations of the post war conditions in the country, most elements of Jansen's plan would be applicable to the landscapes to create new socio-environmental experiences. However, with urban immigration and a rapidly increasing population, Jansen's open-space system in the urban fabric gave way to uncontrolled urban development. His housing projects would be incrementally demolished to increase the density and most of his integrated green spaces were lost in this process.

Furthermore the ideology and discourse of landscape in Turkey have changed dramatically. Ankara's modernist landscapes have been targeted by developmental projects of conservative political parties that erased the city's collective memory of the Early Republican Era. As the conclusion the paper states that even though they have materially faded away, the modernist landscapes of Ankara constitute a rich and unique heritage for Turkey and for urban design and landscape architecture internationally.

Yiğit-Turan, B. "Modernist Landscapes of Ankara." Journal of Landscape Architecture, vol. 11, no. 2, 03 May 2016, p. 14-25. EBSCOhost, doi: 10.1080/18626033.2016.1185230.

PATTERNS of URBAN SOCIO-SPATIAL DIFFERENTIATION in ANKARA

Review by: Günsu Dilara Demirtaş



Although diversity is a defining characteristic of much urban life, globalization and economic restructuring have led to an increase in socio-spatial stratification within modest cities. Natural and social resources are not evenly distributed in urban areas, which cause an unbalanced development and a differentiated socio-economic structure in the urban space. In cities, where socio-economic characteristics differentiate; social status, occupational and cultural characteristics, lifestyles, income level, relative and citizenry relations cause the location of the inhabitants in different areas of the urban space and these socio-economic differences shape the space. The aim of this study is to analyse how socio-economic characteristics of the inhabitants of Ankara shape the space and what kind of differentiation these characteristics create in the urban space.

The lifestyles, norms, attitudes and behaviours of the residents of the city, their professions, their demographic characteristics, household size, the qualities of the residential houses they live in and their income levels are the dynamics that lead to the formation of different social circles in the city. "Changes in socio-cultural and socio-economic dynamics that define the cultural environment in the city are also evident over time. For this reason, urbanization is intertwined with the restructuring processes that have never ceased to interact with demographic, social, cultural and economic dynamics (Knox and Pinch, 2006)."

On the other hand, socio-spatial differentiation is also related to a number of levels of socialization and forms, such as the bonds that city societies have built with cities, perceptions, characteristics of belonging, norms of selfexpression. In addition, the richness or poverty of the urban communities, their kinship, their fellow citizens, their ethnic origins, their common values and attitudes, their residence preferences are important dynamics in the formation of urban socio-economic differences. While many factors have a role in change over time, the distance to the city center often comes out as an important issue. "Access to various services and facilities such as various jobs, shopping centers, schools, health facilities, green spaces, sports centers, entertainment centers are among the latent dynamics of sociospatial differentiation. Access to these services and facilities can vary significantly, depending on the socio-spatial islands formed within the city, particularly the rich or poor regions. As can be predicted, it is more and easier for the rich to access the relatively more qualified services, possibilities and advantageous / privileged regions in the cities (Carr, 1997: 163)"

Given the new economic and social conditions triggered by the neo-liberal restructuring process of neoliberal policies, the gap between the wealthy and the poor in metropolises is growing, and urban societies divided in origin, fellow citizens, immigrants, indigenous or old urban citizens, professional qualities, demographic characteristics, education levels, income levels, are briefly divided into prosperity / quality of life islands. Thus, in terms of the socioeconomic prosperity levels in the cities, the distance between the lowest and the uppermost is growing, especially the privileges of the upper sections of the society are increasing, and the classical polarization is also reflected in the urban space.

This study, which reveals the socio-spatial portrait of the society in Ankara and variations based on it, revealed that there are six different regions in the city. The results of such a study are also important for showing the variation of quality of life in the city. Considering all the zones of the city, except for the 3rd zone, a circular structure with an increase in quality of life from the outermost zodiac to the core is most prominent. At the same time, clusters 1 and 2 (nuclei), which represent the most developed regions of the city and which divide Ankara in two by the north and south is surrounded by 5th, The 5th cluster is surrounded by the 4th cluster and the 4th cluster is surrounded by the 6th cluster. The 6th cluster, which characterizes the intensive residential areas of the groups migrating to the city, is the outermost zodiac, which is the most distant from the locality, to the most developed regions of the city. Specifically, it is important to show that the prosperous islands of the neighbourhood such as Konutkent, Çayyolu, Koru Sitesi, Beysukent and Oran, which have emerged in recent years as a result of the inflow of the upper income groups through the cluster, are separated in the city. The other cluster 3rd , which is the most socio-economically and culturally distant to 1st and 2nd islands and represents a poor and marginalized region in a sense, is a divided island formed by the Ankara Castle, Altındağ.

Yüceşahin, M.Murat; Ankara Üniversitesi, Dil ve Tarih Coğrafya Fakültesi, Coğrafya Bölümü, Ankara, Türkiye and Suat; Ankara Üniversitesi, Sosyal Bilimler Enstitüsü, Coğrafya Anabilim Dalı, Ankara, Türkiye TUYSUZ. "Ankara Kentinde Sosyo-Mekânsal Farklılaşmanın Örüntüleri: Ampirik Bir Analiz." Coğrafi Bilimler Dergisi, vol. 9, no. 2, 01 Jan. 2011, p. 159.

URBAN PLANS of ANKARA

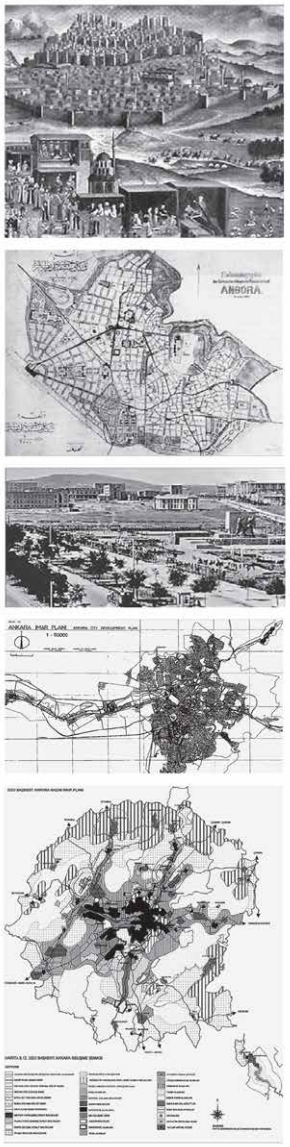
Review by: Melis Erdem

In this paper, urban development of Ankara is surveyed and evaluated. The research includes several plans that were taken into consideration while designing the city from the plans of early civilizations to the plans whose outcome has not been completely reaped off. The study starts off with the early civilizations such as Hittites, and continues with other late civilizations such as Seljuk and Ottomans until the plans implemented in Republican Period.

The early settlements occurred in Ankara due to several reasons such as vast productive agricultural areas, abundant water sources. Before the Republic of Turkey, Ankara Castle whose construction date is unknown but predicted to be in Hitties era had played a significant role in the development of the city with the additions coming from both Romans and then the Byzantines. After the settlement of Turkish tribes, the first mosque of Ankara –Alaeddin Camii- was built. And around that time, several amenities such as a Muslim theological school, a palace and another mosque were built near the Alaeddin Mosque. In 14th century, owing to the long fighting over the throne, the city lost its grandeur. With Ottoman's sovereignty, many religious places were built on the slope and the flat area outside the castle. In 1917, Ankara suffered a devastating fire and due to the materials used in the building, it lost one-third of the buildings.

Upon the Republican Period, Ankara was chosen as the capital of Turkey owing to the several reasons such as having an aim of creating a modern city, having a separate identity from the former Ottoman Empire and its capital and it was also aimed to be an example of a modern city to the other cities. With the determination of urgent needs of the city such as preparation of a city plan efforts were focused on solving these issues and so as to do that several plans were developed.

The first one of them was Lörcher Plan Period (1924-1932), the urban specialist of it prepared two versions of it, the first one focused on placing the population of the city around the Ankara Castle. Lörcher's second plan, prepared in 1925, required a second, independent new city directly to the south of old one which actually means there is a new "management district". Lörcher's new approach of preserving the Ankara Castle merely as a historical and cultural object, Lörcher with his city plan brought Ankara an active and symbolic element. For this reason, the monumental effects of the castle was used as a silhouette of the city. A hierarchy, level of importance appears in his plans starting from public to private. He also divided different functions all around the city so as to make a new center emerge from all of these facilities. However, due to the problems occurred carrying out Lörcher's plan, government had to seek for a new plan that would meet the needs of the new city; however, even his plan of the city could not be applied entirely, it would always have a leading role in the future development of Ankara. The next plan, Jansen Plan Period (1932-1957), Ankara's main development direction was towards the south. The castle was adopted as "the crown of the city" and the city was started to be supported by a lot of amenities such as healthcare buildings, sport centers, museums, etc. Moreover, a Forestry Farm and a City Zoo were founded so as to show that without proper natural resources, irrigation, agriculture and animal husbandry can also be done. The first mass housing named "Bahcelievler Housing Cooperative" started in Ankara. Because of this, the beginning of 1930, the first squatters' houses of Turkey appeared in Ankara. However, there was a need for change in Jansen's Plan in 1937 by adding another axis of development in the east-west direction to the north-south axis already present in the plan due to the first squatter's houses. In Yücel- Uybaddin Plan Period (1957-70), the city was considered as a single-center city that would develop like an oil stain. The existing northsouth and east-west axes of the city were preserved. The plan also proposed a higher density settlement than the Jansen Plan. However, the residential architecture from the 1920s and 1930s were destroyed, and it gave damage to the historical memory of Ankara. In addition to that, the number of increased buildings caused environmental problems such as heavy air pollution, especially in winter. Due to the rapid development and the enlargement fashion, Ankara became not only the center of administrative affairs,it was, at the same time an industrially developing city.Founding a continuous planning office for the city, Ankara Metropolitan Area Master Plan was founded in 1969. Grand Ankara Master Public Improvement Plan Period (1970-2007) specifically interested in future developmental areas of the city rather than existing settled areas. However, against the will of the developers, the city continued to develop towards south. However, when the mass housing applications put into effect in 1980s, the city started to develop towards the west and south-west. 2023 Capital Ankara Master Public Improvement Plan (2007-present) aims to design and manage the process related to the 100th anniversary of the Republic of Turkey, which will take place in 2023. Providing methods of intervention, making a series of sectoral and spatial studies which will make the present economy are its aims. It tries to create new areas of commerce, health, education and recreation.



Özbilen, Emine. "Urban plans of Ankara in 20 and 21st Century." Prostor 21.2 (2013).

TOWARDS a DISTINCTIVE URBANISM

Review by: Zümrüd Nabiyeva

The paper is a documentation of an interview with Kenneth Frampton. In his essay 'Towards a Critical Regionalism: Six Points for an Architecture of Resistance' he argues the ubiquity and uniformity of İnternational Modernism. According to Frampton contemporary design and production Technologies might be used for a new distinctive urbanism.

In the age of globalisation the cultures of the cities have been effected because of the mixture of people identities, ranging from the mobile global transnational elite, to economic andd political migrants. In this case architecture oscillates between the paradoxes of memory and amnesia. On the other hand national identity no longer provides a comprehensive impetus for innovative architecture.

Asian urbanism was another subtitle of the interview. Frampton defines Asian cities 'cities without history' which evokes a polemic with Bernard Rudofsky's Architecture without Architects. Frampton calls for Heidegger's idea of 'bounded domain' as a precondition for an architecture of resistance. Asian urbanism does not only install Jean Gottman's unbounded 'megapolis', also Manuel Castells's 'megacity', 'network city', Rem Koolhaas's 'generic city' and even Saskia Sassen's 'global city'.

Neo-traditional culture and vernacularism is what Frampton might be willng for. In Critical Regionalism, it is believed that 'civilisation' was the adversary of traditional culture. According to Frampton there is a contemporary equıvalent to traditional vernacular architecture which is going to help for shaping specific and unique forms of vernacular urbanism. He continues by saying the latin root of vernacular is 'verna' which means rustic, and states that rustic is the only possible way for creating a pattern between the urbanism and agricultural vernacularism. Thanks to the deep connection between vernacularism and rural traditions the current urbanisation of China is generated where the cities are generally segregated from rural and agicultural land. Erbil, in Iraq is another example for vernacular urbanism. Here the coherence of regional vernacular is rooted purely and continuously. Erbil is not a designed city, but evolved one in which the emergent growth of the city is seemed by the domestic unit and the strong figüre of the ancient Citadel. While supporting his argument Frampton gave example from Zygmunt Bauman: "He has argued in his book Culture as Praxis tradition and innovation are mutually interdependent and while one cannot have a living tradition without innovation, one also cannot have significant innovation without tradition."

Industrial revolution and progress of industry has always been a catalyst for urbanisation. The power of design and production technology today is the potential for the creation of architectural differentiation. Computational design and fabrication is possibly the most effective tool with which design can be specified and the association between spaces, material systems, programmes and people can be established.

Iconic architecture is another debate that has been hold on. Those highlighted buildings often have alien and incongruous relationships to their existing context. Frampton answers to this question in this way: You are right, of course to insist on the importance of the image. However, I would maintain that this is quite different from the caricature of the brand image as this has beed promulgated by 'star architects'".

Beidler, Kyle Joseph. Sense of place and New Urbanism: towards a holistic understanding of place and form. Diss. Virginia Tech, 2007.

BUILDING RECOMBINANT ECOLOGIES

Review by: Demre Ertem

One of the biggest challenges in planning is the design where humans are. By scientific materialists, ecosystems is intended to describe the relationship between organisms and their surroundings. Because of human technology transformation, design should reconcile ecological and urban parameters to achieve a lower energy future. Recombinant design patterns provide new programming approaches to urban environmental problems, bringing together an ecology of the city in context production.

Building Recombinant Ecologies: Recombinant design integrates ecology, engineering, architecture, urban design and social policy into design models that are not possible with only one design disciplines. In biological sciences, recombination creates new cross structures that are performance attributes that are lacking in the original organism, such as being transplanted into one another. Recombinant thinking in design proposals by University of Arkansas Community Design Center (UACDC). UACDC's mission is to advance creative development in Arkansas through education, research, and design solutions that enhance the physical environment. Four out of eight recombinant design patterns described in this article.

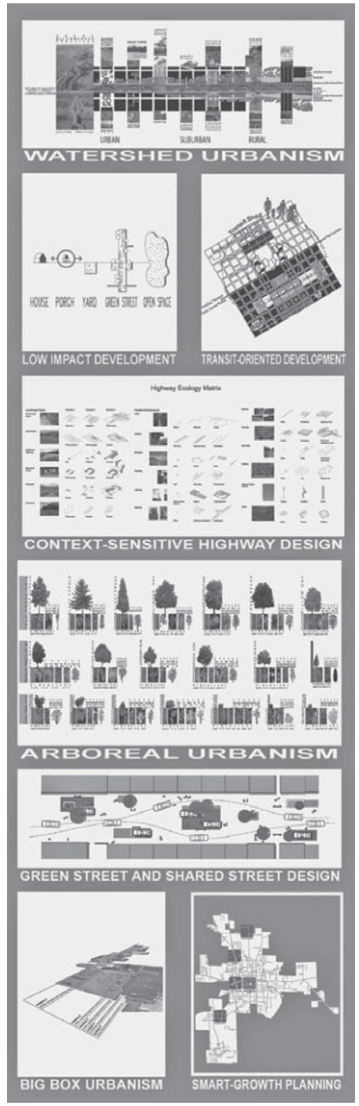
Low Impact Development: Parks, Not Pipes: LID is an ecological stormwater management approach modeled after nature: it manages rainfall locally on a vegetated treatment network that holds water. The purpose of the LID is to sustain a predevelopment hydrological regime using techniques that infiltrate, filter, store and develop the flow of rainwater at the source. If the project's horizontal infrastructure was built without pipes, catchment basins, and curbs and gutters, street costs decreased a lot.

Green Street and Shared Street Design: Botanizing the Street: Green Streets, shared streets, and context-sensitive highway design are the modes of creating places to improve the out-of-traffic function of streets in order to increase liveliness in neighborhood settings. Shared Street is the most radical in the recombination of multifunctional structures that produce new frameworks that resemble more gardens than traffic corridors for collective life. The streets are designed as traffic urban spaces that extend the living and commercial activities of the residents abandoning the existence and even potential of social activities without the use of traffic control devices and signals. Most importantly, the shared street does not remove the car from the ground; but, it suggests a recombinant approach to bring together multiple services while creating new habitats.

Watershed Urbanism: Rewilding Riparian Fabrics to Shape the City: Watershed urbanism recommends the use of well-drawn linear parks, urban open spaces and pedestrian facilities' urban networks, while also promoting "rewilding" of corridor corridors to fulfill the lost ecological functioning. Alongside street and block fabrics, healthy riparian fabrics can be good idea in biological exchange and energy flow within the city. Important components of a riparian (riverside) system include a floodplain, riparian banks, and stream channel. Three watershed planning options, which provide incremental ecological services, serve as a planning platform for adaptation to various budgets and corporate will.

Transit-oriented Development: Socially Optimizing the Transportation Network: The movement of people has radically altered our ecological space and added extreme stress to the world's ecosystems. Mobility has been privileged than choice in terms of speed and distance of access, ease, equality and transit. The light rail vehicle is the most efficient motorized transit mode by all criteria: economic, social and environmental.

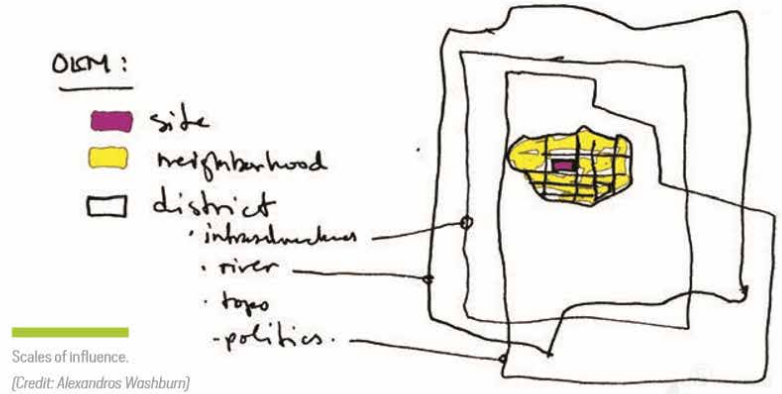
Conclusion: Recombinant design requires attention to the development of new disciplines and social formations in order to put into force design solutions seeking a network intelligence. Each of the four planning initiatives needs a solid network. These kind of constituencies should understand the benefits in recombinant approaches in order to be alive project.



Luoni, Stephen, Building Recombinant Ecologies, in Parr, Adrian and Michael Zaretsky. New Directions in Sustainable Design. [Electronic Resource]. Abingdon, Oxon [England] ; New York : Routledge, 2011.,

The PROCESS of URBAN DESIGN

Review by: İpek Topalkara



Scales of influence.
(Credit: Alexandros Washburn)

The chapter suggests that urban design and its realization is rooted in three main factors which are politics, finance and design and requires their alignment on the decision. The question of today's urban design is how to enable sustainable growth in cities. It is said to be a cycle of observation, analysis and representation.
It is a struggle to decide the form and function of the future city that will sustainably accommodate a changing population and shifting demographics while increasing resilience. The election results and creating rapid economic profit are much more valued than good design.

In the case of urban design the starting point is designing a question. This is the first phase followed by proposing a solution and the third and the final solution is to implement the solution. Unlike the common belief the writer suggests that urban designers do not build the city itself but build the tools that build the city and in this case the client becomes the government. However local community groups are also important as they are deeply informed on the issues, local culture and necessary solutions hence can aid the designers. In addition institutions, private developers play a role.

Program of an urban design is the list of objectives a project must meet, a list of functions for which a plan must provide space for. The area of control is the very brief definition of a site in urban design however the implemented design decisions do not stay in a given area and may end up affecting the whole city if thought carefully. Hence area of influence is subjective as it does not have strict boundaries and goes beyond the constraints.

People's behaviors in a city are the most important object of observation in urban design. However it cannot be made passively as the human dimension, the sense of the history and the ecology of a place can only be perceived by actually being there. The things observed in the process of urban design are called precedents.

Dimensioned plans, and also site sections are crucial in aiding the people to understand how a space is divided among its users and the interaction between the space and the surrounding buildings in addition to the sun, rain, wind and topography.

There are certain subsystems relating to urban design and some of which are social networks, transportation, lighting, housing, shopping, landscape, way finding and power. Collegial design techniques are used to integrate a broader perspective to the design decisions made and prevent the creation of something which comes from a single mind and hence increase intelligence.

The implementation of urban design is matter of the forces of finance and politics and a project which also has a design aspect in addition to these is a good project which will also be implemented. Time value of money is used when deciding whether a design is financially supported which causes some projects to be eliminated. A good judgement of an urban design can be made through a consistent point of view.

Washburn, Alexandros. The Nature of Urban Design : A New York Perspective on Resilience. Island Press, 2013.

PLANT COMMUNITIES OF URBAN WETLANDS: PATTERNS AND CONTROLLING PROCESSES

Review by: Çisem Bozbek

Throughout human history, humans have lived near or in wetlands. Their flat topography and nutrient-rich soils made them excellent locations for building and agriculture, although drainage was usually necessary. Furthermore, wetlands are often located near navigable waterways, making them an important location for ports and industries that require large water supplies. For these reasons, it is no wonder that many urban centers developed and displaced wetlands associated with rivers, lakes and coastlines. While hydrology is the most important variable underlying the development and functioning of wetlands, vegetation is often the most visually obvious character. The species composition and diversity of vegetation that develops in a particular wetland integrates the geological, climatic, hydrological, and biogeochemical processes of that wetland. In turn, the plant community directly affects habitat for invertebrates, fish, and wildlife, and plays a central role in nutrient cycling, organic matter accretion, and support of detrital-based food webs in and outside of the wetland.

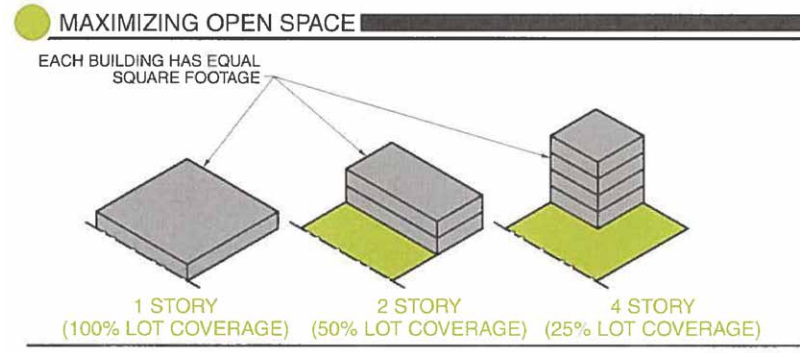
While the diversity of species and communities may be high in urban wetlands, much of the species richness can be attributed ton on-native and invasive native plants. A survey of 45 naturally occurring wetlands and 51 mitigation (restored or created) wetlands in the rapidly urbanizing city of Portland, Oregon, reported a total of 365 species, but more than half of these in both types of wetlands were non-native species. Non-native species may also occur in seed banks and be dispersed via water in urban wetlands. Urbanization has caused losses of wetlands around the world. In the US, wetlands were destroyed during development of sections of Washington, DC , New York, Seattle, Boston, Dallas, Miami, Philadelphia, Juneau, New Orleans and Chicago. During 1954 to 1974 more than 3.6 million ha of wetlands in USA were lost due to urban development with losses decreasing to about 39,000 ha total for the decade of the mid-1970s through the mid-1980s.
In Europe, the port of Rotterdam was expanded to tens of square kilometers in size to accommodate large ships and refineries beginning after the First World War, which included damming of tidal rivers, dredging shallows, reclaiming tidal mudflats, and reshaping of islands, all of which eliminated wetlands; expansion of ports in Marseilles and LA Havre, France, had similar consequences.

Variables such as surrounding land-use distance between wetlands, degree of hydrologic alteration, and water quality can then be correlated with the index values for each wetland. The sites with lower floristic quality index values were associated with more urban land-use and greater distances to other wetlands. However; it is not clear if lower floristic quality indices are indicative of lower plant biodiversity, because most formulations evaluate only native species richness and the disturbance ranking is zero for non-native species which mayo or may not be favored by urbanization.

Baldwin, A. H. "Plant communities of urban wetlands: patterns and controlling processes." Urban ecology: patterns, processes, and applications. Oxford University Press, USA. http://dx. doi. org/10.1093/acprof: oso/9780199563562.003 10 (2011): 77-84.

SUSTAINABLE SITES

Review by: Halime Kızıl



LEED is a certificate rating the usage of green systems, in which Sustainable Sites (SS) is one the categories and the goal is set on reducing environmental impact of a building site and maintaining the ecological cycle for the life of that building. The SS category addresses four main strategies including site design and management, reduction of rainwater runoff, the heat island effect and light pollution. Site design and management is a key factor since it would help to conserve, restore and protect the environment. Also, supporting biodiversity increases ecosystem productivity and it can help a damaged ecosystem, like the one selected for the project, to recover. It will later provide clean air and water, while controlling erosion. There might be a need for a site assessment team, considering opportunities for open space, examining site contamination and remediation needs and the level of disturbance of the site. Overall strategies to site design and management can be;

-prevention of construction pollution (like airborne dust and erosion by using water and silt fencing),
-protection and restoration of habitat (by using native soils, plants and an effective hydrology system),
-reducing building footprints (also lowers the costs and environmental impacts, while building "up", instead of "out"),
-increasing density (smaller building footprint without reducing the occupied area),
-maximizing open spaces (requiring outdoor spaces to be equal or greater than 30% of the total site area, also providing healing benefits for people),
-planting native and adapted plants,
-development of a sustainable site management plan (addressing all chemicals used on the site, the cleaning of hardscape and the building's exterior and pesticide management).

Rainwater management helps to minimize the need for the city water in irrigation or flush fixtures and it can be applied to the selected site, where drought is not an issue. To achieve this, impervious hardscape can be reduced (via use of green roof or porous pavement, asphalt and grid pavers), passive rainwater management system could be established (redirecting rainwater to planted areas, such as rain gardens, bioswales and dry ponds; also gabions consisting of rocks held together through a wire can prevent soil erosion and saturate the soil.) and active rainwater management system can be installed (capturing, storing and transporting rainwater). The heat island effect leads to increase in microclimate temperatures and occurs due to waste heat from human activity, building operation and heat absorbing surfaces (like asphalt roads, parking lots, rooftops and other hardscapes). Instead of exposed hardscapes; open grid pavings, shading systems and green roofs can be installed on the site. Also, during the material choice, paving surfaces should have a high solar reflectance (SR) and materials for the roof should have a high solar reflectance index (SRI); thus, they should be light colored and reflective surfaces. Elements leading to light pollution consist of uplight (causes artificial sky glow), glare (high angle front lighting) and light trespass (misdirected backlight to near places). To eliminate these problems, motion sensors and timers can be installed where people may not be present for long periods. Additionally, overlighting should be avoided and BUG (Backlight, Uplight, Glare) Rating should be considered to locate the fixtures according to intentions.

Cottrell, Michelle. Guide to the LEED green associate exam. Vol. 17. John Wiley & Sons, 2010.

PARAMETRIC NOTATIONS

Review by: Candan Budak

In the text- Parametric Notations- Mario Carpo examines how the roots of parametric design is coming from classical Middle Ages. First of all, he explains how parametric design creates variations. Calculus notates mathematical functions using variables (X, Y) and parameters (a,b,c) . To generate general formula of curves we write the equation y=ax2+bx+c which represents all parabolas. When we replace a,b,c by numbers we have one particular parabola. When we change numbers, we have different variation of these parabolas. Deluze who is author of The Fold corner stone of digital Parametricism suggests new kind of general script which defines all objects, not in particular. This kind of parametric notation is so suitable to computer based design and fabrication of new nonstandard objects in today's digital age. This digitally intelligent architecture has changed world architecture. In early 1990's new digital tools were adopted by deconstructivist and formalist designers to design and build complex geometries and non-geometrical objects. It was generally about architectural form and this digital turn changed the architecture.

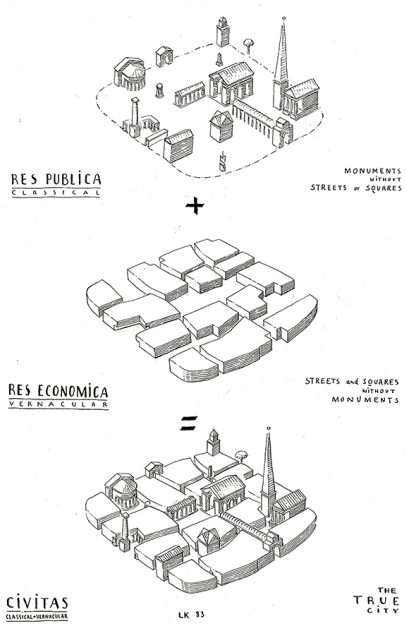
Besides all of these Carpo strongly states that digital Parametricism was not born end of 20.century, it is deeply rooted in classical antiquity in Middle Ages. For instance, when Vitruvius and Alberti explained how to build column (Doric, Ionic, etc.), they didn't give any image or illustration of visual example of what these parts should actually look like, they had verbal rules, proportions and format of sequence. As a result, they produced all different yet all similar, because end products shared a common script. For example Corinthian capital is not an object but class of object, mathematically defined by generative rules (like suggested by Deluze). With similar formula and geometrical rules they explained how to make an object step by step but did not determine the shape of each piece. As a consequence, architectural parts with same function and position are often similar but not identical.

Since Renaissance printed images replaced verbal rules and exactly repeatable models replaced generative algorithms. With the Industrial Revolution, mass production spread from pictures to 3D objects, and the modern culture and technologies of identical copies replaced ancient variations. Today's digital Parametricism is similar to this medieval way of building, just like classical one which is generative and rule based design which gives chance to endless variation within its limits. This is why it was and still is a revolution because it produces variations like ancient Parametricism, it is combining antiquity and modernity in itself.

Carpo, Mario. "Parametric Notations: The Birth of the Non-Standard." Architectural Design, vol. 86, no. 2, Mar/Apr2016, pp. 24-29.

NATURE of the ARCHITECTURAL OBJECT

Review by: Damla Tarman



Krier, Léon, et al. The Architecture of Community. Island Press, 2009.

Traditional architecture is divided two part; public symbolic institutional building and utilitarian private buildings. To explain one example; if factories have the facade of cathedral or if churches look like industrial ware houses the politics of values are threatened. This article defend that main public buildings should seen themselves but the others (private buildings) should not imitate their forms. Many examples are given; chapels has a religion symbol of Christianity, if any building which has the symbol accept as a chapel or church without looking their form, there are something wrong about value policies.

The second important topic is that surprised me nameable objects and so-called objects. These two object terminology sometimes create confusion. I will try to explain an example of this confusion; a garden city is not a true city not a true garden or a curtain Wall is not a Wall not a curtain. In this example nameable objects are garden and city, and curtain and Wall but so-called objects are garden Wall and curtain Wall. The example is church or chapel still can give for so-called building, it is just assimilating to church because of its symbol of cross, but the form of it does not have any similarities of real church form.

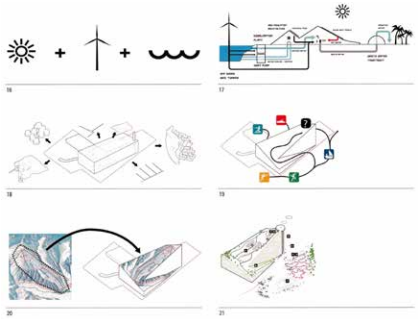
The aspect is about true and false monuments; the article defends that the utilitarian skyscraper and land-scraper are fake monuments. Because they are horizontal and vertical buildings with utilitarian function under a single roof. On the other hand, civic buildings, churches, temples, theatres, museum or bridges are true symbolic and public elements so they are privileged in monumental architecture. The fake monumentality reveals itself in the meanness of its ceiling height and room sizes. Also a single utilitarian function cannot create true monumentality. Instead of a one single building with one door under a roof, the structure should compose of many buildings with different functions. The author divided building style in two categories; authoritarian style and democratic style, both of them are called as a monster. Because they just have one door and one single roof, all part connects with each other. He defend true programme is conceived like a town, seeing building articulation according to their function and importance instead of huge single building. He shows us that; a town is not a large building, or a building is not a small town, a city is made of streets and squares, building blocks and monuments.

The topic which mentioned in this article is authenticity problems, the crisis of authenticity general occur because of inadequacy between building technology and architectural appearance and confusion of traditional and modern architecture. Traditional building techniques generally apply to use natural building materials such as wood, earth, clay and tend to produce objects for long term use but modernist building techniques use synthetic building materials, Ferro concrete, plastics, glass and steel and tend to produce for short term consumption.

The last aspect is about traditional architecture which comprises two disciplines; vernacular building and classical architecture. Vernacular is defined like domestic and classical defined the highest class. Vernacular building concerned domestic and utilitarian buildings with civil engineering works. Classical architecture is the artistic culture of vernacular buildings; it concerns the symbolic language of construction with decoration of public structures, squares. Also vernacular buildings style represents the culture of forms and repletion of basic but classical architecture develops universal styles.

MONUMENTAL WASTE and YES IS MORE!

Review by: Fatma Betül Güreş



The paper discusses three examples of new urban monument:
1. The Amagerforbraending waste-to-energy plant by BIG (Bjarke Ingles Group)
2. BEI- Stockholm scheme by Heatherwick Studio
3. Newton Creek Wastewater Treatment Plant by Ennead.
All of the examples above are using Sert, Gidieon and Leger's 1943 manifesto:
"Nine points of monumentality" as starting point.
(1) Monuments are human landmarks which men have created as symbols for their ideals, for their aims, and for their actions.
(2) Monuments are the expression of man's highest cultural needs. They have to satisfy the eternal demand of the people for translation of their collective force into symbols.
(3) Every bygone period which shaped a real cultural life had the power and the capacity to create these symbols.
(4) so-called monuments of recent date have, with rare exceptions, become empty shells. They in no way represent the spirit or the collective feeling of modern times.
(5) There are no frontiers between architecture and town planning, just as there are no frontiers between the city and the region. Corelation between them is necessary.
(6) A new step lies ahead. Postwar changes in the whole economic structure of nations may bring with them the organization of community life in the city which has been practically neglected up to date.
(7) The people want the buildings that represent their social and community life to give more than functional fulfillment.
(8) Sites for monuments must be planned.
(9) Modern materials and new techniques are at hand.

1. The Amagerforbraending waste-to-energy plant

Waste-to-Energy Plant that doubles as a ski slope for Copenhagen's citizens. Cultivates public awareness of waste related issues. Visitor center informs the public of the processes taking place. From a distance, the entire building is wrapped in a vertical green façade formed by planter modules stacked like bricks turning it into a mountain from afar. It acts as a buffer with factories on one side and housing on the other.

2. BEI-Teesside power plant by Heatherwick Studio

Called BEI-Teesside, the building will be covered in panels planted with indigenous grasses. Combining innovative technology and design, the power station will reduce carbon emissions 80%. Biomass is a clean and environmentally friendly way of generating electricity.

3. Newton Creek Wastewater Treatment Plant by Ennead

This Project is a total renovation of the newtown creek wastewater treatment plant, seeking to update the architecture to reflect environmental mindfulness as well as capture the enterprising essence of new york city. Bold colors and simple geometries define the aesthetic of ennead's renovation

"Yes is more"

This is an architectural comic book -Archicomic- realised by BIG (Bjarke Ingles Group). It is a way of realising a diagrammatic discourse which offers us a new perspective towards architecture and the needs of the society and creates opportunities for innovative concepts. For instance "ecolomia" came out while combining the words economy and ecology, which is in fact the project slogan. Climate change and sustainability are main concerns. "Ecolomy"- Sustainability takes into account ecology but not economy. As the name of the comic suggests, "Yes is more" is a play of words of "Less is More" by Mies. In observing the diagrams, drawings and comics with high dose of iconography and a peculiar sense of humor, it follows that this is a design and work system for architecture.

Poirer, Gabrielle. "Monumental Waste." Journal of Architectural Education, vol. 65, no. 2, Mar. 2012, pp. 118-124. EBSCOhost, doi:10.1111/j.1531-314X.2011.01177.x.

Pastor, C.E. "BIG's Diagrammatic and Sustainable Architecture." EGA Revista De Expression Grafica Arquitectonica, vol. 20, no. 1, 01 Jan. 2012, p. 184-193.

ECOSYSTEMS of BITS and BYTES

Review by: Merve Yüksel

This paper focuses on the architectural- robotics. To define them, it is more useful to define what is not architectural robotics. In this modern age, they are not high- technological devices or systems. For example, they are not intelligent buildings, environments which focus on the temperature controls or opening/ closing of windows. They are not robotics, which moves mechanically such as walls, floors are repositioned. And they are not human-robot or human-computer interactions.

Architectural robotics is mainly interaction between cyber-physical systems where we maintain to keep digital-physical mix. The understanding of concept, architectural robotics can be perceived differently. Since the cyber, computing or any screen-based artifacts are not enough to fulfill the social space; the architectural robotics can easily accommodate them. This term much more give an emphasis on architectural machinery and people and how they can be connected, rather than technological robotics and smart materials. It is also connected with the physical space, which can form according to needs of people and tools.

In this manner, we can find useful examples here: Centre Pompidou, Fontaine des automates and Bibliotheque Sainte-Genevieve. For the Centre Pompidou, its key feature is architecture- as- scaffolding; display the configurations on screen of the building. It totally shows us an intimate marriage of architectural machinery and people instead of showing illogical marriage of masses and architecture. For the other example, Fontaine des automates, including sixteen whimsical moving sculptures representing themes and works. With them, we can understand people's physical engagement with the machine-sculptures. They have a pleasure of machines while they are joyfully pedaling. Last example is Bibliotheque Sainte-Genevieve, which does not actually seem a mechanical building. It was designed to be like a mechanism which communicates with the public by text, verbally. There are words and texts that are covered the whole façade of the library. Instead of having some architectural language like ornaments, physical masses on the façade they prefer to use some texts. They think differently from the common architectural manner. They focus on the "communicative power of architecture". Therefore, we can find a way to look at differently to the understanding of the architecture.
To conclude, architectural robotics could become a new language for people in the field of architecture. They enhance the social aspects, interaction between people. They include both individuals and group. Architectural robotics can bring us together in digital and physical space. They are more localized and intimate which contribute to being maintained locally.

"Communication network is a nervous system, architecture is an ecology and the planet is a machine."
John MCHALE

Green, Keith Evan. Architectural robotics: ecosystems of bits, bytes, and biology. MIT Press, 2016.

UNIVERSITY is a SOCIETY

Review by: Sezgi Kırkın

"The university was designed as a total entity, a three-dimensional modern grid spread over the barren of Anatolian prairie, and, in half a century, succeeded in transforming its immediate environment into an 'ideal landscape'". "A University is a Society" written by Sargın and Savaş examines the formation of the METU campus in Ankara and the way in which the Anatolian prairie was transformed into an urban environment. Throughout their examination Sargın and Savaş essentially refer to numerous concepts of both architecture and history. Stating that "Politics is the most assertive realm of change,..." they begin by identifying the ways in which politics effected the METU campus since the ideological formations of politics have the power to not only transform the environment but they can also fabricate the cultural sphere. Sargın and Savaş, having examined the METU campus from historiographic perspectives, focused on practice, performance and appearance. Historiography can answer how and to what extent the ideal landscape was effective. Ankara as a city was also undergoing a transformation that was triggered by the desire for modernization while the METU campus was being created. The primary objective of the city planning of Ankara was not aesthetic and the modern concept of beauty called for social utility and functional performance rather than being merely "beautiful". The re-construction of Ankara and its modern transformation can be regarded as a reflection of the larger political will to tame(domesticate) the Anatolian bozkır in a modern and edenic manner. The Turkish prairie is in fact an active subject of revolutionary transformation that subsequently leads to societal progress rather than being an object of transgression. Throughout the years of its transformation the Ankara was in search of its urban identity. Furthermore, Ankara was regarded as a tabula rasa of the Turkish Revolution.

Along with the desire of modernization that was on going in Ankara post World War Two, the influence of Western ideology and architecture in the university's development cannot be neglected. The planning of the METU campus shared common ground with the ideology premises of the new Republic. Both Ankara and the METU campus became models of Turkish modernism's debut with reference to landscape architecture.

In the initial planning of METU there was a deliberate attempt in merging the vast green area of the designated campus, with the city and architectural elements such as central core-walks and arcades were emphasized. "Immediate construction of the pedestrian pathways, arcades and terraces surrounding the heart of the campus that would not only unite functionally the separate schools, but would also, from the very outset, be symbolic of the new university community." Certain principles were taken into account by architects Perkins and Godfrey, who later became further involved with the university, and they are as followed; 1) Concentration of the academic core within a 10 minute walking interval 2) Exclusion of automobiles from the central green and the courts of each of the schools 3) Creation of a system of courts to provide protection against the weather between the Schools, around these should be grouped activities 4) Development from the centre outwards 5) Providing accommodation for at least ¾ of students at all times 6) Enhancement of the character of the site and preservation of views of the Citadel, Ankara and the hills 7) Use of local materials of a limited range of color .It is evident that in the formation of the METU campus, the spaces between buildings were as important as the design of the buildings. Landscaping, planting of levels of verges and terraces, even of street furniture carried great significance. Additionally the architectural approach of METU concentrated on transparency which is both a literal and phenomenal concept. The aim was to make the surrounding landscape visible through the architectural elements.

Being located further away from the city centre meant that it would be challenging for the students to share in the social and cultural functions of the city. A solution to this challenge was the formation of a campus that would take the city as its model. The new development was named university city, where the education was not confined to the teaching hours but took place all around the campus. Due to the fact that the intention was to create close contact between students in different fields and the faculty outside of the classrooms, residential, recreational and athletic facilities were prioritized. Even though the formation of the METU campus had begun by transforming the existing prairie into an urban environment, it has done much more than this. Not only are the environmental and aesthetic values being highlighted in the architectural planning of the campus, also the curriculum and campus life are very significant parts of this transformation. The unique architecture of the first faculty building at METU can be read as the physical manifestation. This physical manifestation is certainly a response to the political, environmental, socio-cultural and even so aesthetic values of the region. While making this physical manifestation, METU actually is making a statement both architecturally and environmentally. The general formation of the METU campus can be regarded as a total entity which is made up of overlapping layers (from politics to architecture) that meanwhile makes great reference to its environmental history.

Sargın, Güven Arif, and Ayşen Savaş. "A University Is a Society': an Environmental History of the METU 'Campus'." The Journal of Architecture, vol. 18, no. 1, 2013, pp. 79–106., doi:10.1080/13602365.2012.751806.

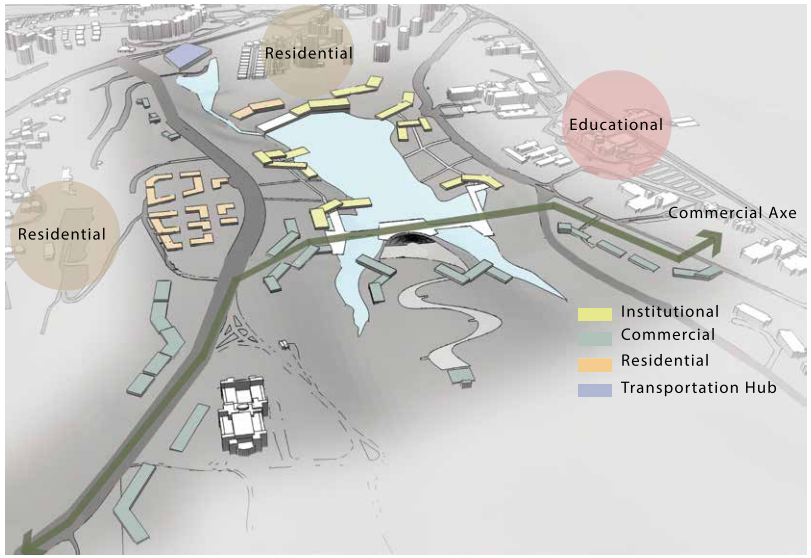
PROJECTS

2.0

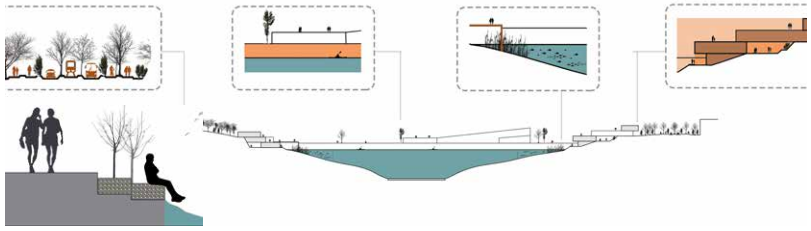
GREEN for BILKENT: GROWING for LIFE

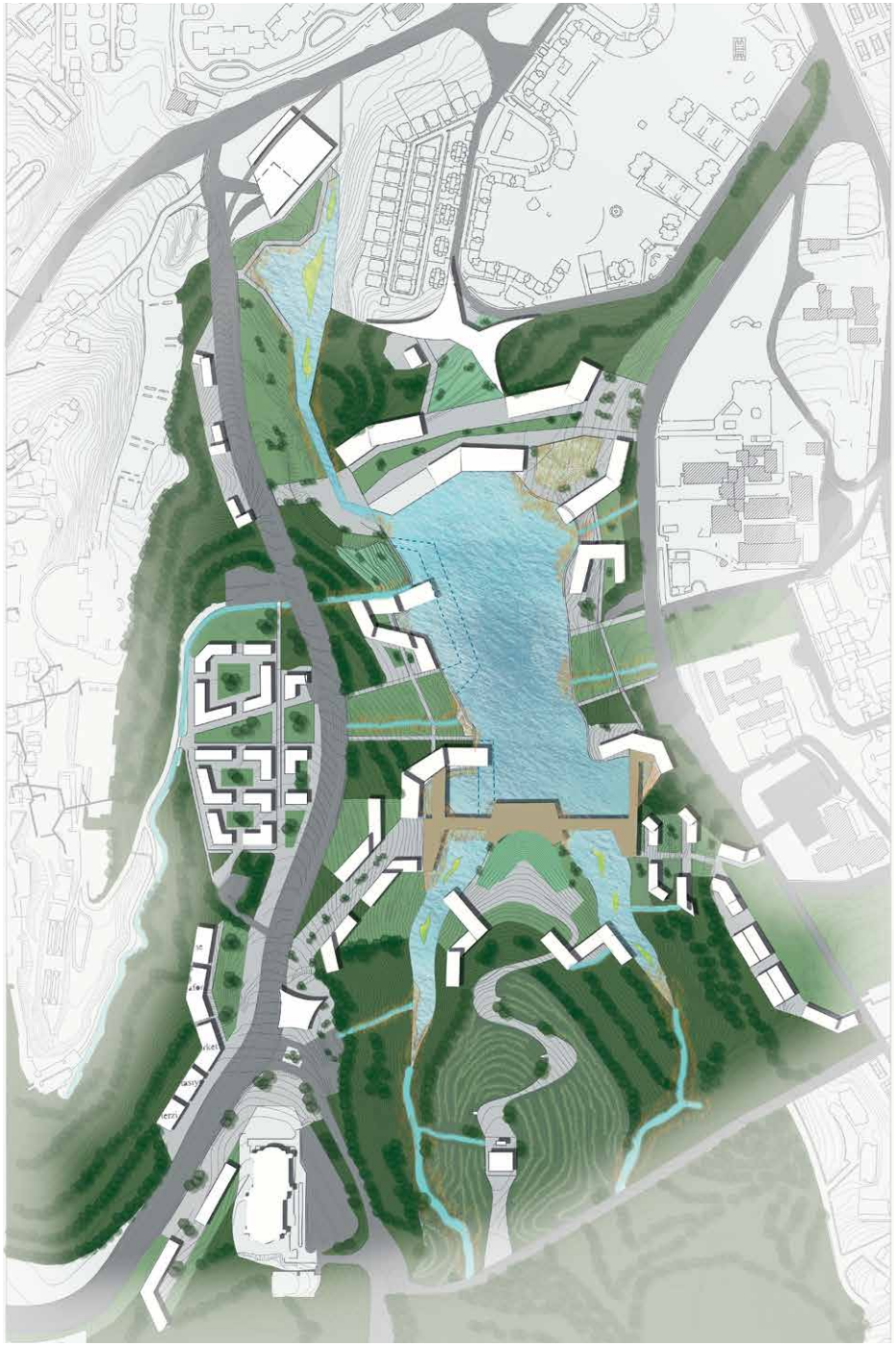
CANDAN BUDAK, HALİME KIZIL, MERVE YÜKSEL

The world population is increasing exponentially; therefore, food demand is proportionally growing. When classical methods for producing food are used, water necessity for irrigation and forest loss because of land use for agriculture go up. In the world of new agriculture concepts like; vertical gardens combine green thinking with eco-technology so as to turn a space into a place where people can learn, practice, and get accustomed to growing their own food. The project is developed with these precepts.



When the site is examined in city scale, Ankara has a huge possibility for application of this eco-technology because of its irregular rainfall, cold climate and general soil type. Moreover, there outstanding universities of Ankara; METU, Bilkent and Hacettepe have opportunity to research on this technology. All these university campuses have similar settlement and topography, due to the fact that each has their own small pond, which gives a possibility to establish aquaponics systems. Aquaponic systems are the combination of aquaculture (raising fish) and hydroponics (the soil-less growing of plants), this hybrid system grows fishes and plants together in one integrated medium. The fish waste acts as an organic food source for the plants and the plants naturally filter the water for the fish. Consequently, if self-sufficient system for our site in terms of water treatment, food and energy is successfully constituted, it can be applied to METU and Hacettepe as well. Also, students of these universities can visit the site and make researches about this technology. Thus, in the master scale it is decided that all three campuses should be combined with economical, clean and sustainable public transport system, called Met-rail. It can be operated at very low costs and requires less maintenance compared to other similar systems. Also, the ratio of passenger to carriage weight is relatively low, while at the same time turn radius is minimum for such types (30 m). Moreover, it has less environmental impact with energy efficient solar panels.



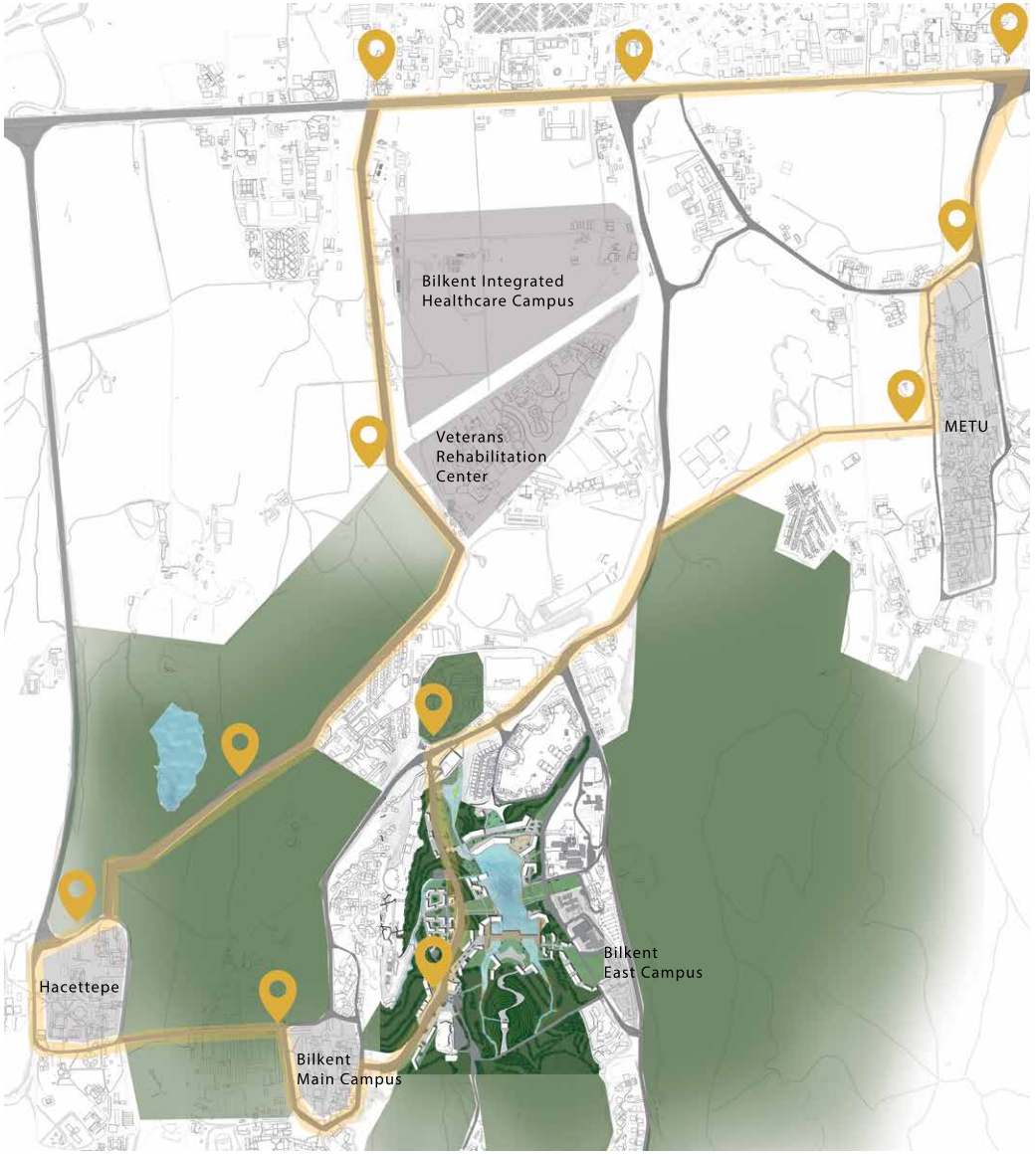


1-TRANSPORTATION HUB
2-SEMI OPEN RECREATIONAL AREA
3- REHABILITATION AND MEDITATION CENTER
4- ACCOMMODATION
5-DAM
6-BIOMEDICAL RESEARCH CENTER
7-ADMINISTRATIVE AREA
8-VERTICAL GARDEN RESEARCH AREA
9-VERTICAL GARDEN PRACTICE AREA
10-WORKSHOP AREA
11-SEED LIBRARY AND SHOWCASE
12-RESTAURANT AND CAFE
13- SHOP
14- WINERY HOUSE
15-BIRD WATCHING HOUSE
16- STATION
17-BOOK STORE
18-MUSIC STORE
19-TAILOR
20-STATIONER
21-MARKET
22-HAIRDRESSER
23-PHARMACY
24-FACULTY OF MUSIC AND PERFORMING ART
25- AMPHI
26- STAGE AND DECK
27-RESIDENTAL
28-COMMUNITY CENTER
29- ODEON
30- VINEYARD

Furthermore in terms of urban context it can be seen that healthcare facilities were clustered in this specific location. Atatürk Hospital, Bilkent Integrated Healthcare Campus, Veterans Rehabilitation Center are generally complexes that provide service on practical aspects of healthcare. The overall design concept and functions lays on development of further research and development in this field, since it is thought to be what this area needs essentially. Biomedical research center will be focused on future studies about human and animal healthcare.

When it comes to the site scale, a transportation hub is located near the security gate of Bilkent University. From here, the monorail goes to the Faculty of Music and Performing Arts, which is located near Mayfest Greenery Area and then, it goes to Main Campus of Bilkent University. The monorail road also defines a commercial axis that goes along the pond. Other than that, there is a main commercial axis, acting as a pedestrian promenade between Mayfest Greenery and East Campus Green Area, connecting two campuses of the university, which are normally far apart. In addition, there is a visual axis between top of the hill and the dam which was tried to be kept and enhanced. Existing buildings also give references to new building locations in the design of the area. On the east side of this pedestrian axis, generally restaurants and cafes are located.

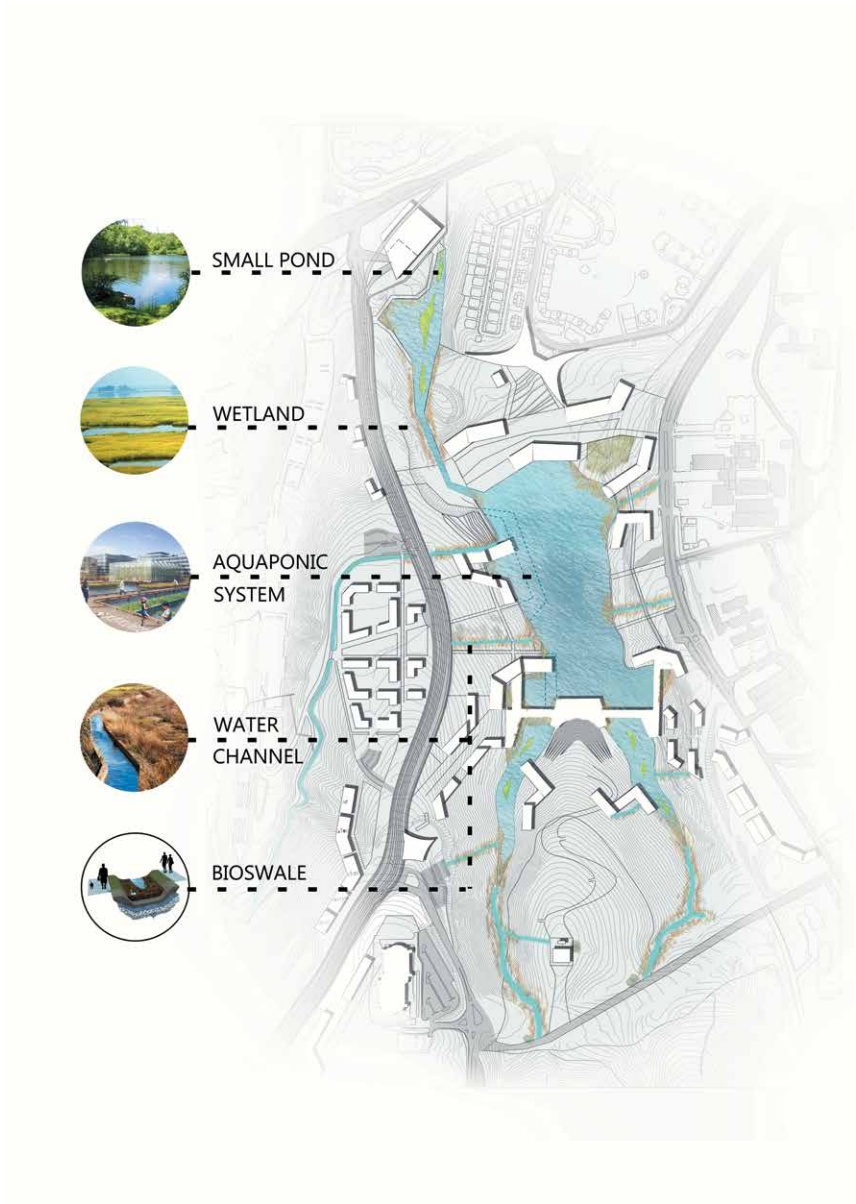
On the lake, there is a free stage to perform music, theatre or any kind of art where students of Faculty of Music and Performing Arts can benefit and make profit. On the west side of the commercial axis, which is near to Mayfest Greenery and residential area, there are commercial units providing public service such as pharmacy, tailor, hairdresser, small market. On the other hand, smaller loop going around the lake is connected from both sides of this commercial axis. Around the lake, there are hydroponic gardens, research and development center, seed library, an education center where people can learn about this kind of agro-culture, a workshop for exploring and inventing new ideas for hydroponic technology, an organic food shop where products of hydroponic farming were sold. Beside this, vertical gardens have some advantages in terms of both spatial organization of design and using the sun efficiently, because the main food production field is lifted above, gaining the vegetation more exposure of natural sunlight and fresh air. At the same time, the ground level would be freed with nicely shaded open spaces which are an enjoyable place for public.

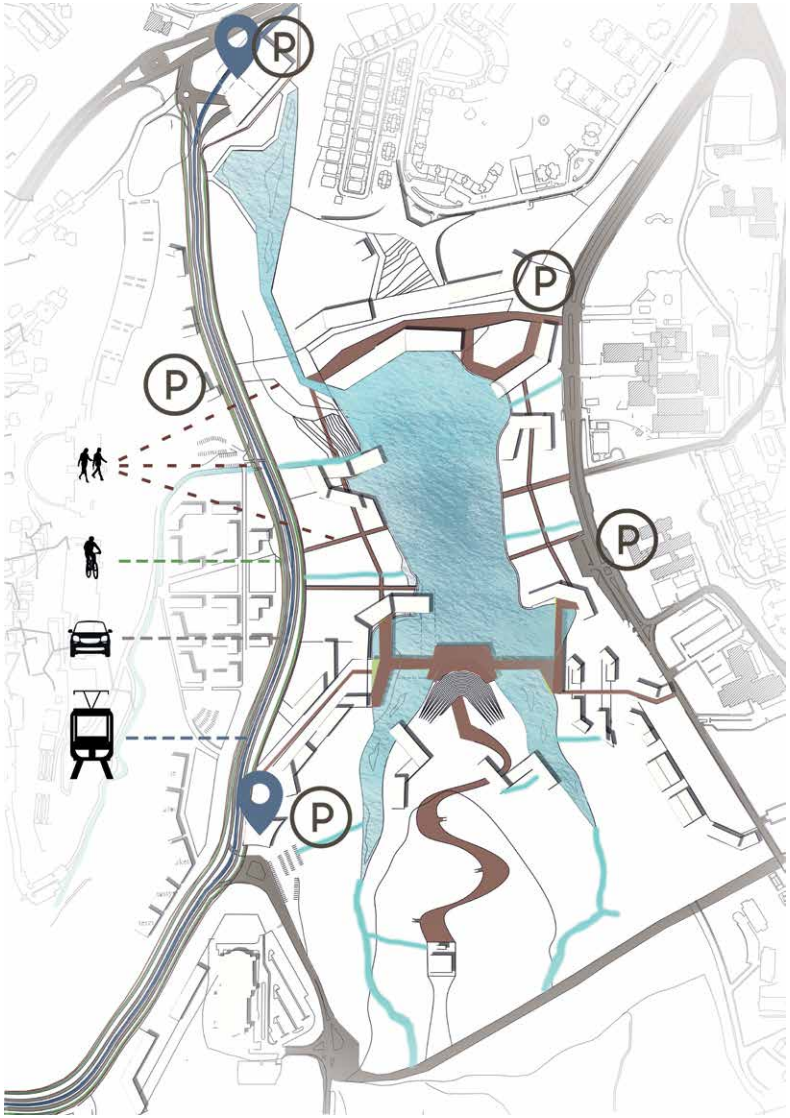


Hydroponics is the practice of growing plants only by using water, nutrients, and a growing medium. This technology consists of three basic elements; first one is a pump, which is placed under every system. Its task is to spread the water over the whole system, to every seedling. Next, liquids are spread by small channels. By them, liquids can also go back into the pumping, or in the case of aquaponic technology, they nourish fish or other water animals. Last part of this system is pots with plants filled with special base allowing water and oxygen to flow. Hydroponic gardening is not only about food; it is a place where people can work on to develop further the hydroponic technology; they can exchange their ideas and opinions. People can get interested in some very important causes, while at the same time having fun and being educated. Hydroponic systems can be built on many levels. Since the method is suitable for growing plants indoors, food crops or flowers can be planted and can be grown all year round. Special lighting appliances would also ensure optimal growth for 24 hours a day. Growing plants and food in this way is environmentally friendly and hence it contributes to sustainability of the overall ecosystem. Additionally, no pesticides are required to boost the growth of the plants; therefore, they can be produced in an organic environment. Most importantly, vertical farming uses 80-95% less water. Another important aspect is the rain water harvesting. In this method, the main aim is to capture the rain that falls on-site (usually on roofs) and to collect this water in the pond. Thus, the water level on the lake can be increased. Also, the collected rainwater can be used for irrigation and toilet flushing or other greywater uses. In addition, it can be used for drinking water if treated adequately.

On the other hand, bio swales are quite efficient tools for rain water harvesting. It is a simple way of retaining storm water in order to improve its quality before it goes into the lake. Moreover, it reduces the threat of flooding, and keeps it away from people. Basically, it is a landscape feature designed to capture and filter rainwater runoff, becoming a part of the drainage system.

To create an environmentally friendly site, biodiversity is another significant issue. The site is designed to give opportunity to variety and variability of any living organism. For this reason, riparian field are preserved; additionally, wetlands are located on water surface. Also, water channels create special vegetation type and habitat for animals. Besides that, bio swales improve biodiversity by creating natural habitats for birds, amphibians and mammals.


SMALL POND
WETLAND
AQUAPONIC SYSTEM
WATER CHANNEL
BIOSWALE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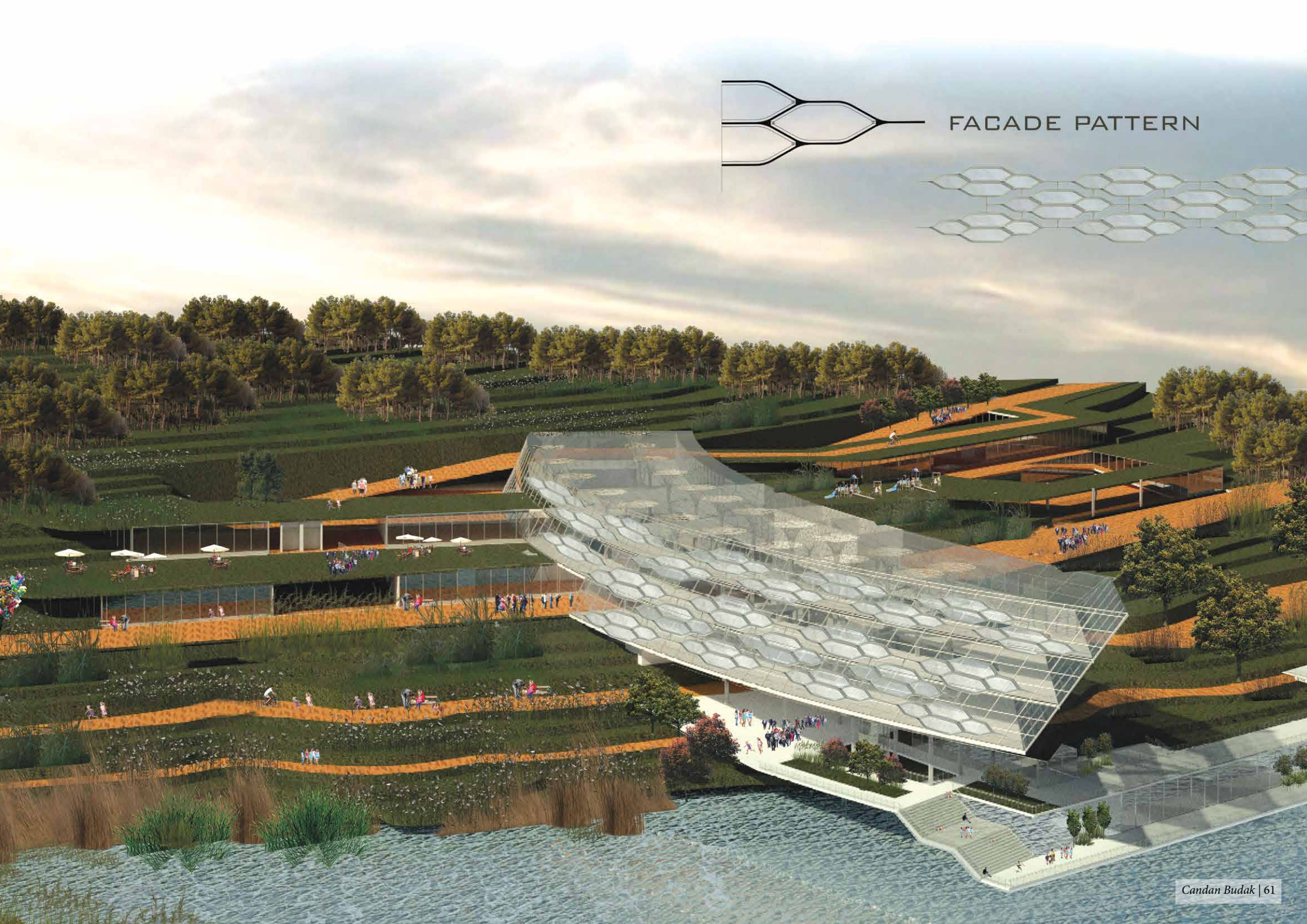
CANDAN BUDAK

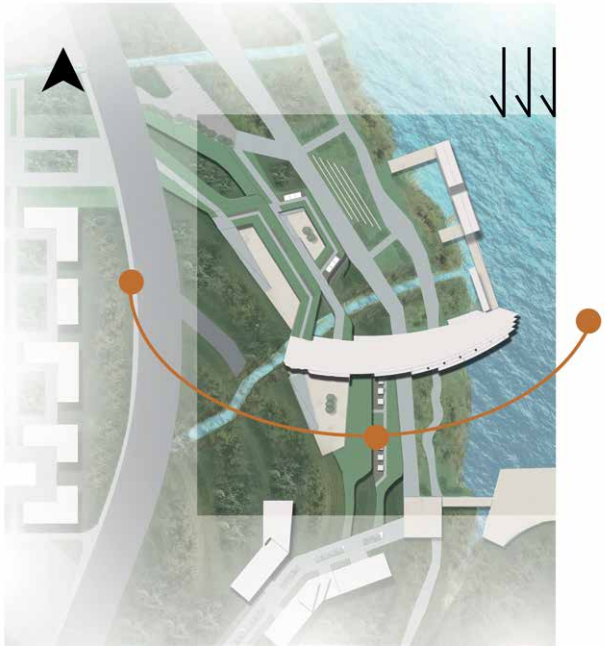
HYDROPONIC FARMING and COMMUNITY CENTER

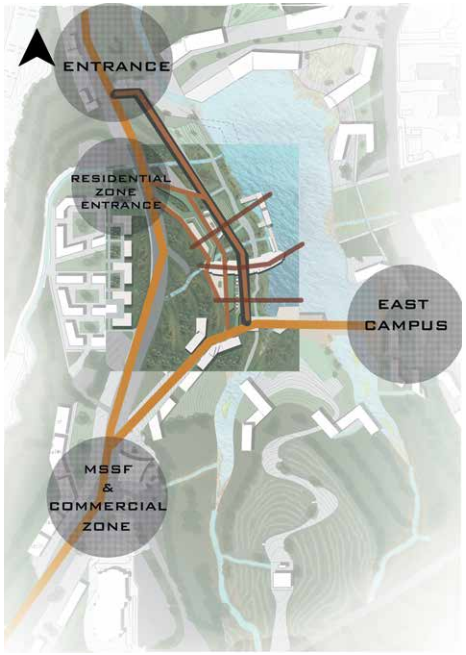
Main function of project is hydroponic farming. For that reason main building is shaped according to the sun path to get maximum day light. Moreover, this building is the only structure which is located perpendicularly to topography and extended through lake which makes this building more remarkable. On the contrary, secondary functions of the project are embedded under topography. Therefore, on the site plan only hydroponic farming and workshops are visible, others are green areas sunken gardens and path ways. There are two main entrances on site plan. These are north entrance which is coming from transportation hub and second one is near to MSSF building and commercial area. Main axes of the site are from north entrance of site to commercial zone which is located near to MSSF building. In order to do not disrupt these axes it can be passed under the main structure. By the way horizontal axis is created according to topography lines. Also, visual axes looking through the lake view. Secondary path comes from residential zone and it is combined to main axes with ramps and sunken gardens. These sunken gardens give opportunity to get more sun light and create different places for each function.

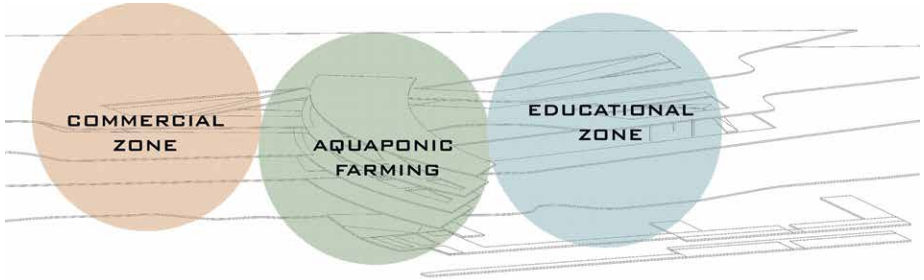
There are three main zones which are commercial are educational are and hydroponic farming and workshop area. Hydroponic farming and workshops are main functions. South façade of main building is used for hydroponic farming. Catwalks are used to access to plants easily. Workshops, admistrative area, restaurant, children workshop and entertaining area and exhibition is located on the north façade. Storage unit is located between hydroponic farming and parking area to get service and manage the process of production easily. Sunken garden near to storage and parking area is used as bazaar. Products can be sold in organic food shop and bazaar. Also there are special restaurants and cafes where these organic products are used. Educational part of the complex is located around other sunken garden which consists of exhibition hall, library and conference hall. Algae faming and fish pools are located behind pier. Algae farming is used to clean up the water which is coming from fish pool before giving the water to the pond. Additionally, fish waste is useful for hydroponic farming therefore water of fish pool is used for plants as fertilizer. Rain water is collected from roof and transferred with tubes inside the columns and used for hydroponic farming.

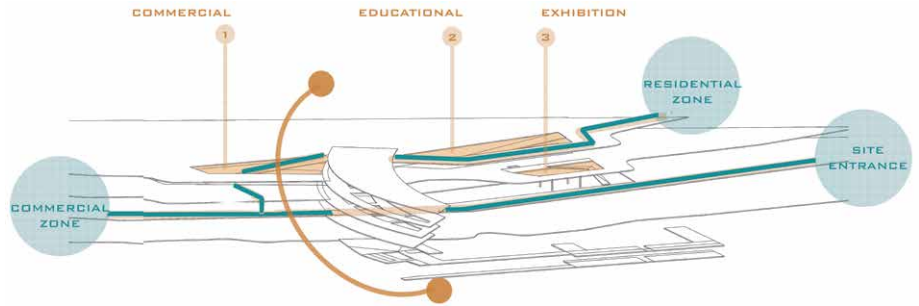
Kinetic facade explores a sustainable shading design strategy that utilizes elastic instability to create dynamic motion at the building envelope.Kinetic facade suggests an alternative approach for the design of dynamic facade system that use a motion to open and close apertures providing shading for the building. If daylight comes to plants directly, it may cause damage on plants. This opening and closing system gives opportunity to control day light on south facade. Semi-transparent fabric is used in this system because when it closed it doesn't block the sun completely and gives necessary day light to plants.

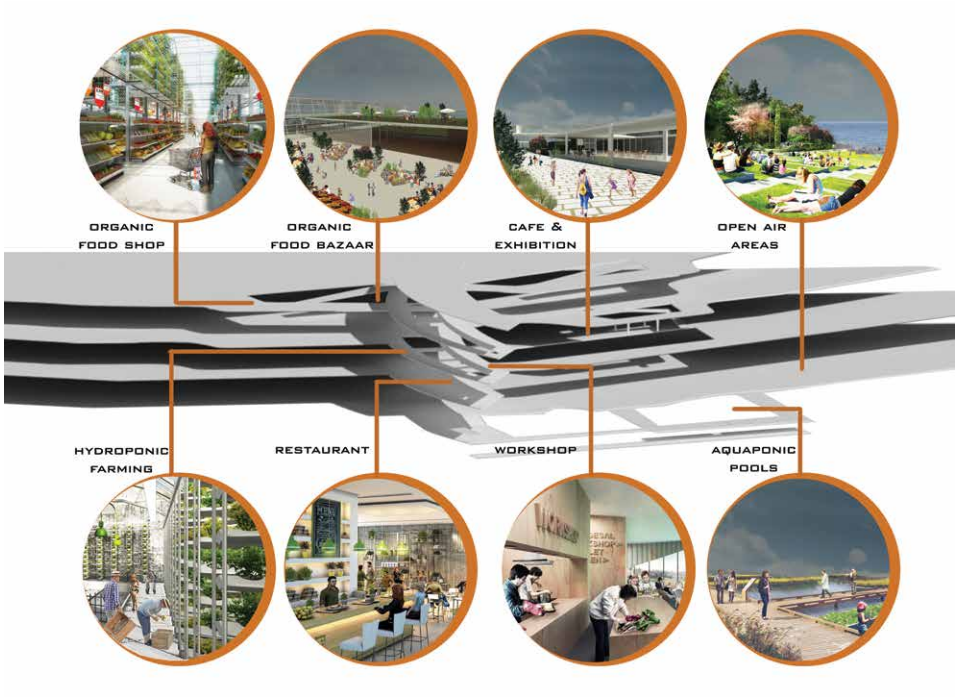

FACADE PATTERN

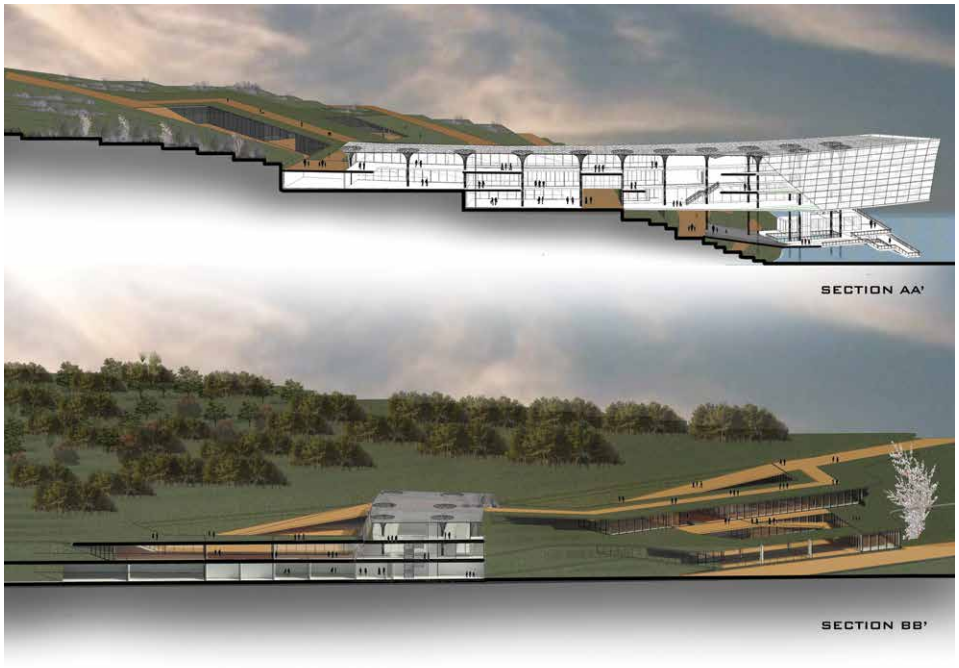



ENTRANCE
RESIDENTIAL ZONE ENTRANCE
EAST CAMPUS
MSSF & COMMERCIAL ZONE

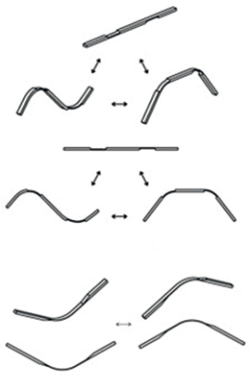

COMMERCIAL ZONE
AQUAPONIC FARMING
EDUCATIONAL ZONE


COMMERCIAL
EDUCATIONAL
EXHIBITION
1
2
3
RESIDENTIAL ZONE
SITE ENTRANCE
COMMERCIAL ZONE

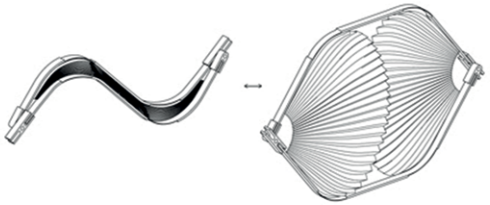

ORGANIC
FOOD SHOP
ORGANIC
FOOD BAZAAR
CAFE &
EXHIBITION
OPEN AIR
AREAS
HYDROPONIC
FARMING
RESTAURANT
WORKSHOP
AQUAPONIC
POOLS


SECTION AA'
SECTION BB'

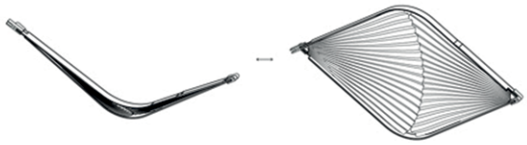
KINETIC FACADE



BASE MODULE OF THE KINETIC FACADE



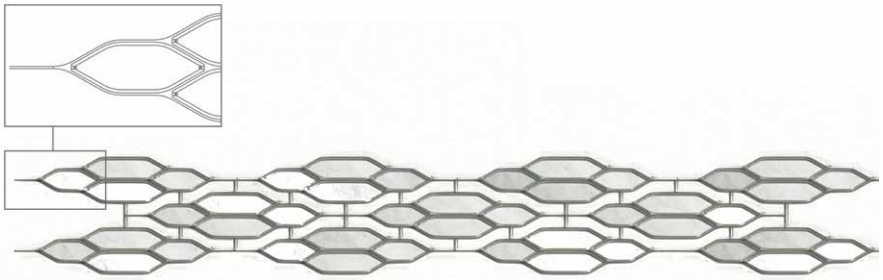
MATERIAL FOR SHADING ELEMENT IS SO SIMILAR TO TULLE. IT IS SELECTED BECUSE IT DOEST BLOCK SUN LIGHT COMPLETELY AND IT PROVIDES PENUMBRA.



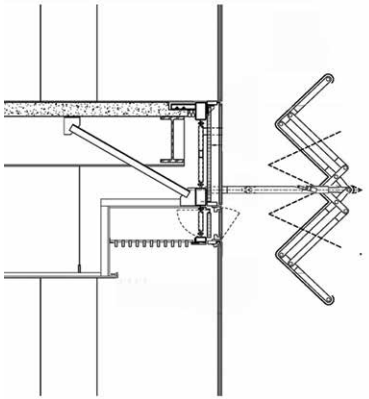
KINETIC FACADE EXPLORES A SUSTAINABLE SHADING DESIGN STRATEGY THAT UTILIZES ELASTIC INSTABILITY TO CREATE DYNAMIC MOTION AT THE BUILDING ENVELOPE.

KINETIC FACADE SUGGESTS AN ALTERNATIVE APPROACH FOR THE DESIGN OF DYNAMIC FACADE SYSTEM THAT USE A MOTION TO OPEN AND CLOSE APERTURES PROVIDING SHADING FOR THE BUILDING.

IF DAYLIGHT COMES TO PLANTS DIRENCTLY, IT MAY CAUSE DEMAGE.ON PLANTS . THIS OPENING AND CLOSING SYSTEM GIVES OPPORTUNITY TO CONTROL DAY LIGHT ON SOUTH FACADE.



FACADE PATTERN



DETAIL SECTION
SCALE: 1:10

INTERIOR VIEW

HALİME KIZIL

BIOMEDICAL RESEARCH CENTER

Considering newly emerging health complexes near Bilkent the growing demand for a medical facility in the site, a Biomedical Research Center was proposed in this project so as to give a response to these needs. The center focuses on prosthesis researches for humans and animals; while also being an academic node, where future studies in these areas were developed.

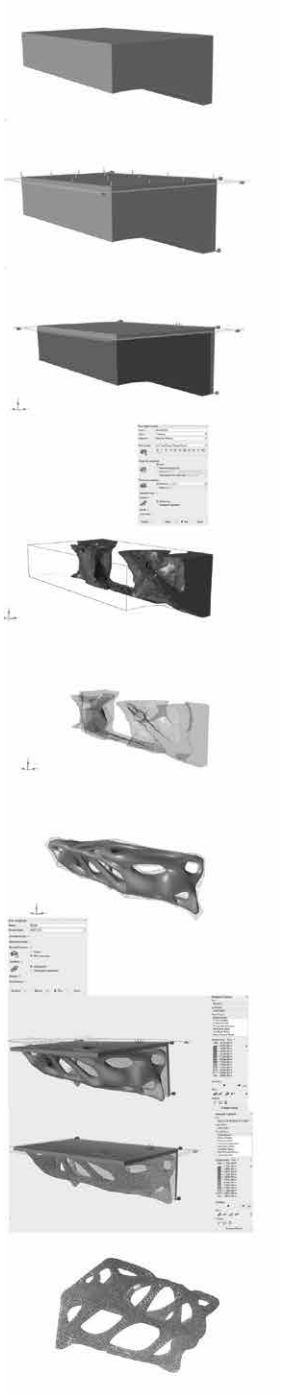
The existing dam structure was replaced with a new one, integrated into the building. The new structure also produces hydroelectricity and creates a self-sustainable building in terms of energy. Since most of the rainwater is directed to lake through purification canals, the water level is expected to increase to a high level and the excessive water is redirected to north side, where a settling pond was created. The stream starts from two corners of the lake, going around the research center while creating a small canal through the building. The shape of canal was designed to face prevailing winds from north and northeast, so that the building can be protected from hot Ankara summers through chilling breezes over the canal. After the first level that water falls down, there is a wetland purification area, where the large body of water gets cleaned through plantation and any bad smell is prevented. Additionally, the circulation around the building is provided with platforms and small pedestrian bridges over the canals.

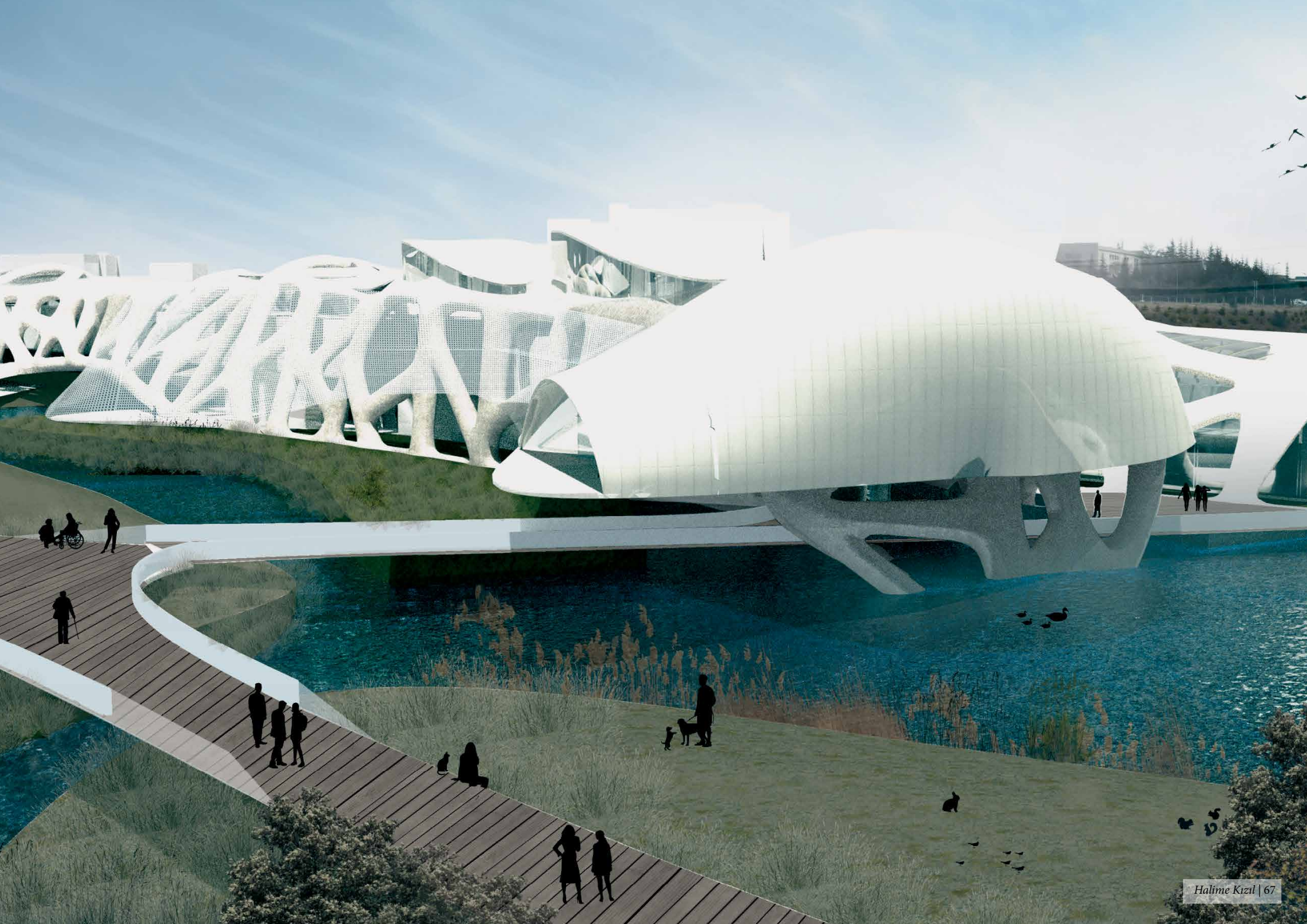
In the site plan scale, one of the main considerations is the direction of people and their circulation. The main body of people is expected to arrive via the transportation hub located in north side, since it is a point of intersection for public transportation and also employs a multi-level car parking area. Also, another public node is at the opposite side of the lake, near East Campus and YÖK Buildings. These two nodes for collecting people were connected with a two-way public corridor, a plaza in west side and a view deck over the riparian area on east side. The public corridor partially intersects with the structure of the building, providing a shelter against south sun.

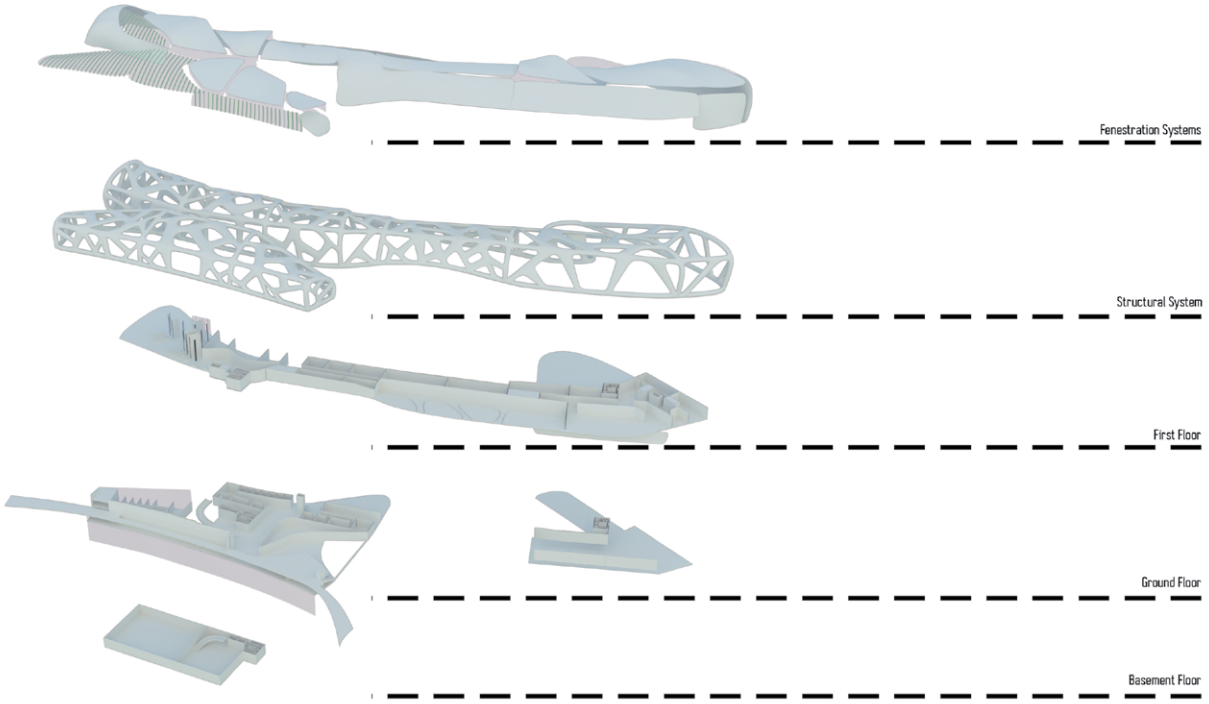
Since the research center will be focused on prosthesis technologies, the structure was designed according to new principles of prosthesis production. With the help of a computer algorithm, the structure can be optimized in such a way that it minimizes the mass while retaining the stiffness of the design. Also, the pattern works in a similar way to the bone growth mechanism, therefore, resulting in a stronger structure than the ones following the conventional way.

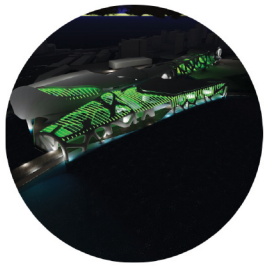
The roof shape derives from the traces of structures and at the same time it opens up towards northeast so as to take the prevailing winds inside the building during summertime.
The shadings over the library, research offices and the cafeteria also act as algae tubes, where a continuous circulation of algae is provided . These tubes are placed over the shadings so that the microorganisms could obtain sufficient amount of sunlight to produce oxygen and nutrients.

By using the potential energy of the still lake, around 45 MW electrical energy will be produced. As the water falls down around 40 metres, the turbines at the bottom would be able to generate electricity and the water will be redirected to the settling pond where the level of topography is lower.



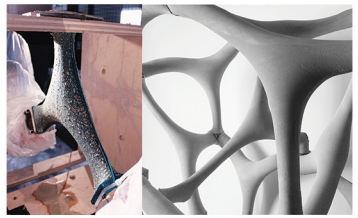



Fenestration Systems
Structural System
First Floor
Ground Floor
Basement Floor



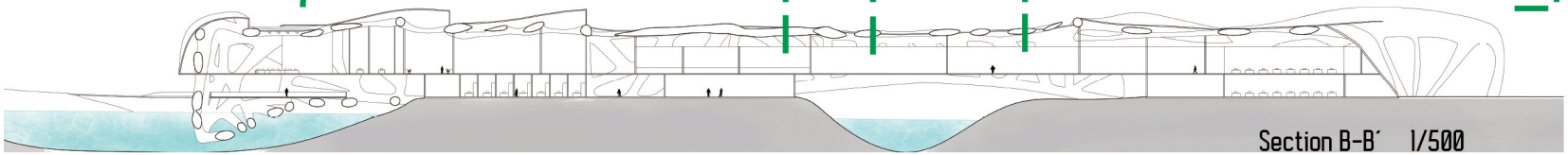
1 Algae produce oxygen and nutrients in the tubes over the shading and also in the oxidation ponds.

2 Harvested algae can be used in energy production

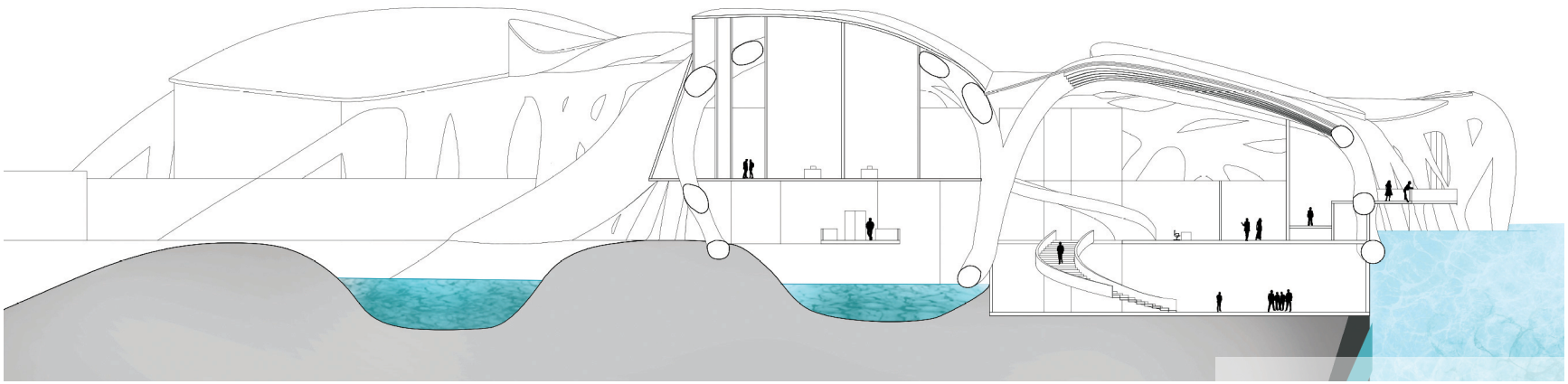


Algae can be dried to be transformed into filament that will be used in 3D Printers 3

4 Used up pieces can easily be disposed in the waste process area since they are biodegreadable

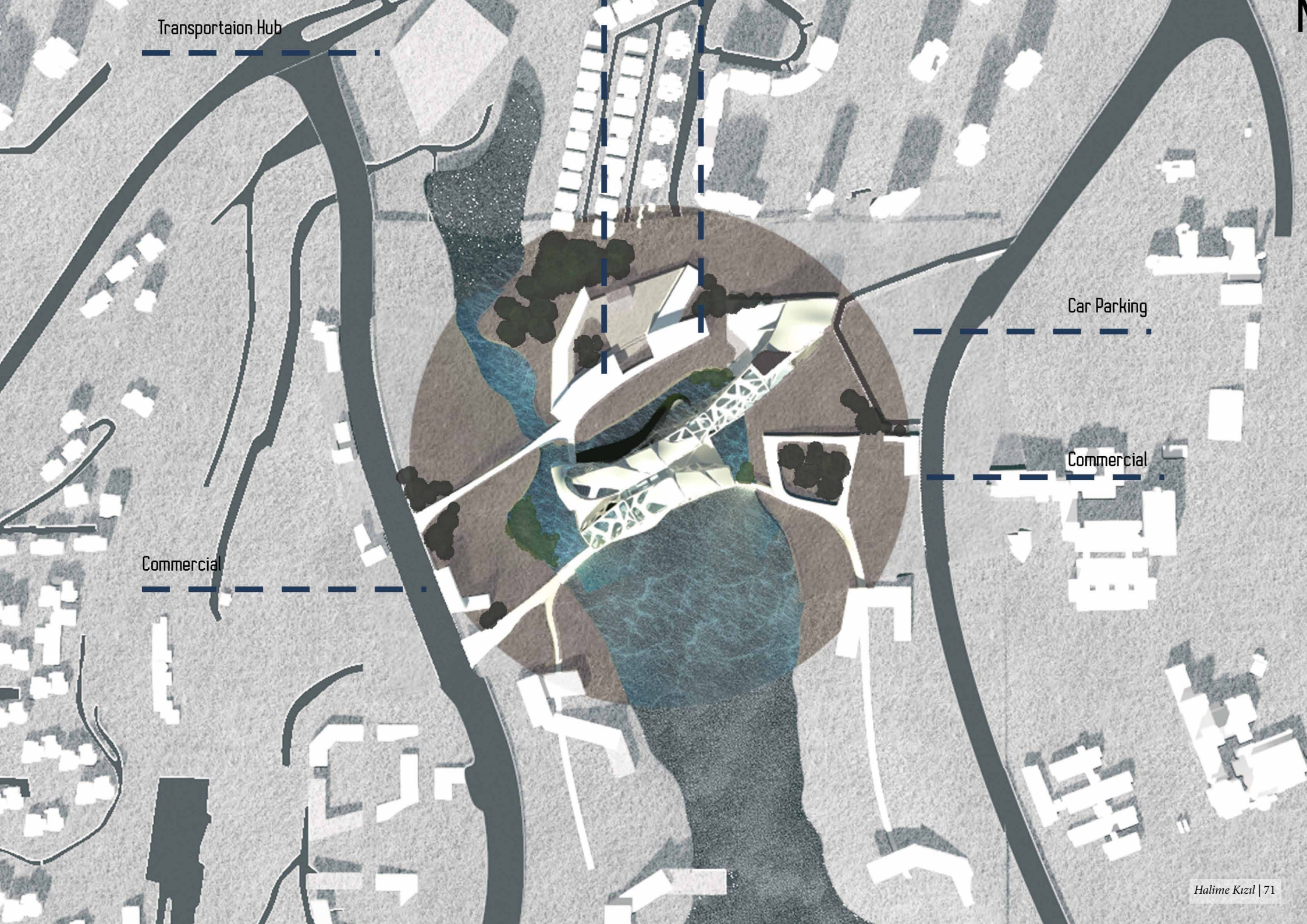


Section B-B´ 1/500



34. Circulation Desk
35. Group Study Rooms
36. Quiet Study Area
37. Books
38. Mini Cafeteria
39 Terrace
40 . Media Room
41. Classroom
42. Classroom
43. Clean Room
44. Electronic Appliances Production Area
45. 3D Printing Area
46. 4D Printing / Prototype Area
47. Filament Production
48. CNC Cutting Room
49. Algae Harvesting Area
50. Waste Process Area
51. Oxidation Pond
52. Test / Simulation Area
53. 3D Printing Area
54. Design Lab
55. Open Research Offices
56. Kitchennette
57. Storage
58. Meeting Room
59. Terrace
60 Administrative Office
61. Research Offices
62. Classroom

AUGMENT


Transportaion Hub
Car Parking
Commercial
Commercial

MERVE YÜKSEL

HYDROPONICS RESEARCH CENTER

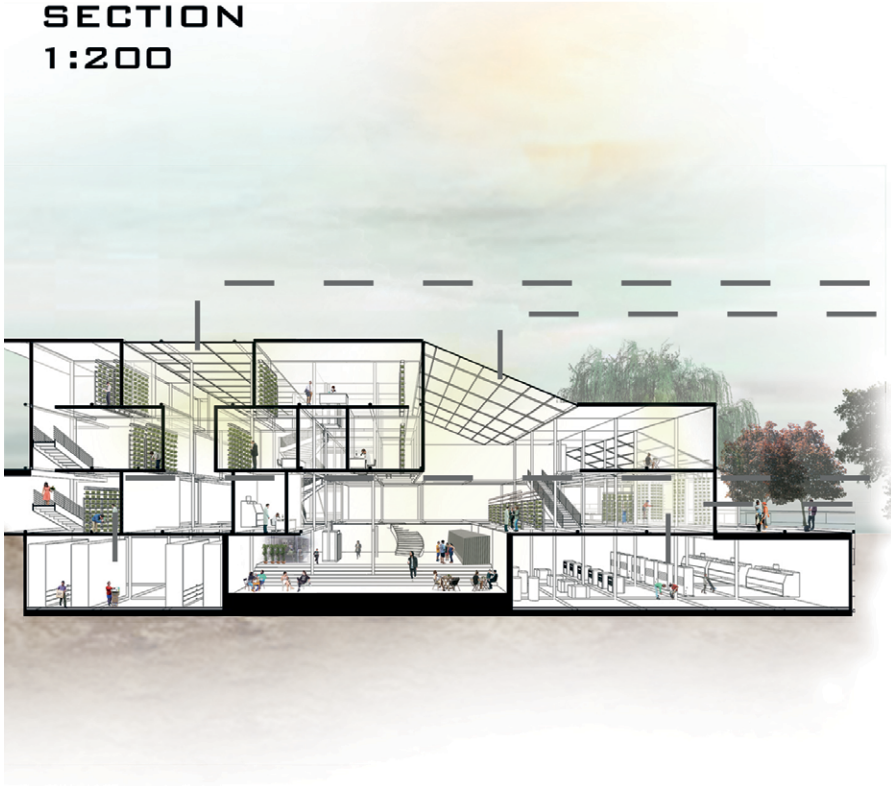
When deciding how to position the building on site I started to consider about environmental issues and our previous master plan decisions. There is already a big riparian area and in order to protect and let animals and plants live there, floating path way is located on it for people to take a breath and walk. There are already water channels but they are dried, I tried to make them alive by systems of water collection, water treatment and water harvesting. Some wetland areas around channels and pond are created, it filters water and let it go into the pond so water is naturally cleaned and used into the aquaponic function. In master plan decisions, pedestrian walkway continues along the water. The existing vehicle road has a potential that people might come from it to the building. When taking into all considerations, I decided to create masses accordingly.
Main building function is a research center about vertical gardens which use hydroponic and aquaponic systems. Since the soil type is not appropriate for doing traditional agriculture, it is much more useful to do hydroponic and aquaponic systems in vertical gardens. In the proposed system Plants and fish are co-habituated in one system. The fish produces waste and it is used for organic food source for plant growing. Main building is created according to the angles of the sunlight, which are winter, summer and equinox. Since the plants are growing inside the building, the south sunlight is most beneficial light for them. However, the plants even need winter light. The current configuration allows for that.

Moreover, the building is not only leading towards the south side, but also, it leads towards the water. For that reasons, people circulation is from west to east, that is from water to vehicle road, it can be only happens with the leveled atrium inside the building. The atrium is working as a bridge between east and west for people circulation; it leads people to go to the water from vehicle road. Also atrium is kind of a public area, where there are cafes restaurants and some stepped floors. With the help of the atrium, the plants have a chance to get sunlight into the deep area.

Since there are laboratories and technical spaces inside building, they are private areas and are positioned in upper levels. The lower spaces are more public areas. Due to topography, basement is used as storage, technical areas and delivery services which can easily reach underground parking and wide atrium which welcome people with some cafes. Transparency of the whole complex has been an important design intention. A transparent building form outside therefore structure of building was decided to seem like a floating vertical garden on the steel structures. Since building is surrounded by the greenery and wooded area as well as vertical gardens inside it, the intention is to have a transparent envelope and facade design so that the building might be lost on the greenery. Whole structure is made of a grid of 4*4 meters steel which not only works as structural elements, but also they work as a water tubes for the aquaponic system.

A system of thermochromic facade design was implemented since the south facade is very big and the building is located in the middle of the greenery and nearby the water. The facade is changing colors according to the temperature. The use of three different colors (yellow, green and blue) changes over the three different temperature ranges. This responsive facade helps plants to get optimum sunlight, not direct light. Where the sunlight hits the surface most, the area turns different colors and layer below is decreasing its transparency because direct solar rays coming are not useful for plants.

SECTION
1:200



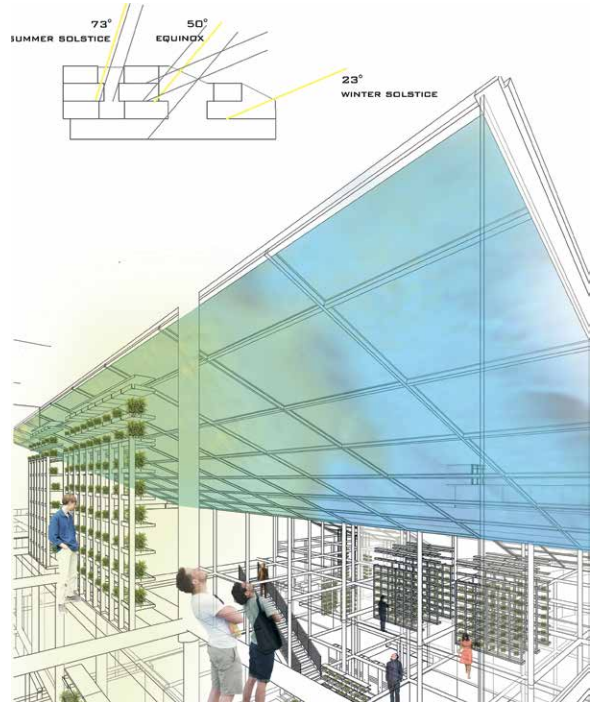
THE OPENINGS IN THE ROOFTAP HELP THE BUILDING INTO DIFFERENT PURPOSES. THE BIG ONE IS CALLED MAIN ATRIUM AREA, WHICH PEOPLE CAN EASILY INTERACT THERE AND IT IS THE ENTRANCE FROM THE WATERFRONT. SOME PARTS ARE SIT ON THE TOPOGRAPHY AND THE ATRIUM ALLOW POEPLE TO LEAD TO OTHER UPPER FLOORS AND INTERIOR GARDENS.

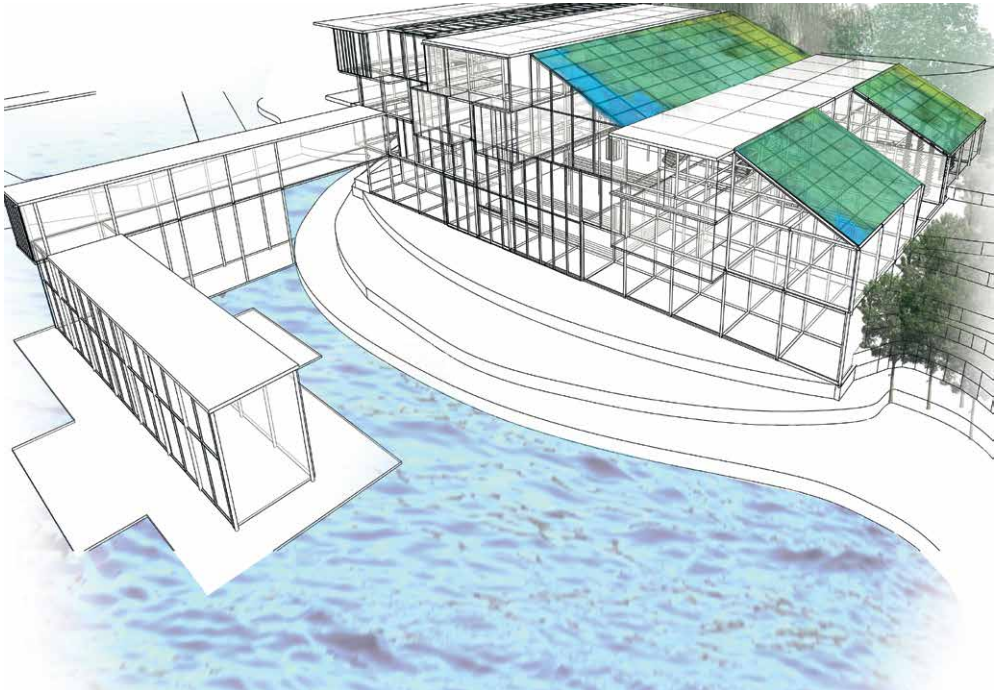
THE SKYLIGHT ON THE ROOFTOP IS OPENED ACCORDING TO DIRECTION OF SUNLIGHT. BECAUSE OF PLANTS INSIDE, THE DAYLIGHT CAN EASILY COME INTO THE BUILDING AND HELP THE PLANT TO GROW IN NATURAL LIGHT. FOR THE GROUND FLOOR, THERE IS NO NEED TO GET LIGHT AS IT IS CLOSED VERTICAL GARDEN,WITH DIFFERENT GROWING TECHNIQUES.

SOME PARTS OF THE BUILDING SIT ON THE TOPOGRAPHY AND THEY ARE IN CLOSED AREA. FOR THAT REASON, I PUT SOME FUNCTION, SUCH AS STORAGE, AQUAPONIC TECHNICAL ROOM AND SERVICE AREA. ALSO THEY ARE CLOSE TO THE AQUAPONIC CENTER AND HELP TO TAKE WATER FROM THERE.

THIS PART IS ALSO IN THE TOPOGRAHP AND THEY ARE USED AS STORAGE. SINCE THE PLANTS ARE GROWING FAST, THERE WILL NEED SOME STORAGE AREAS AND THEY EASILY DELIVER TO THE OTHER PART OF THE SITE LIKE RESTAURANT, CAFES, RESIDENTIALS WHERE PEOPLE CAN USE PRODUCTION.

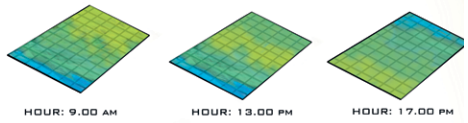
1:200

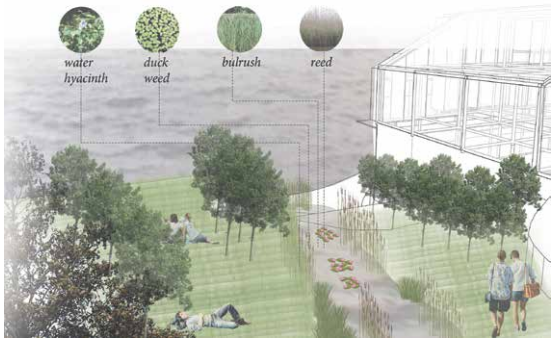


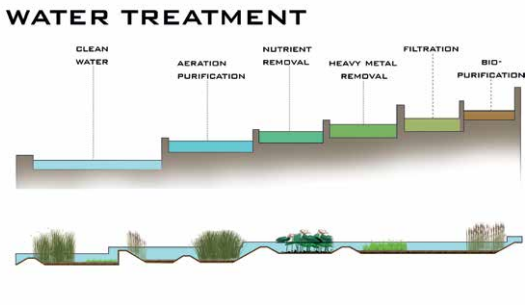


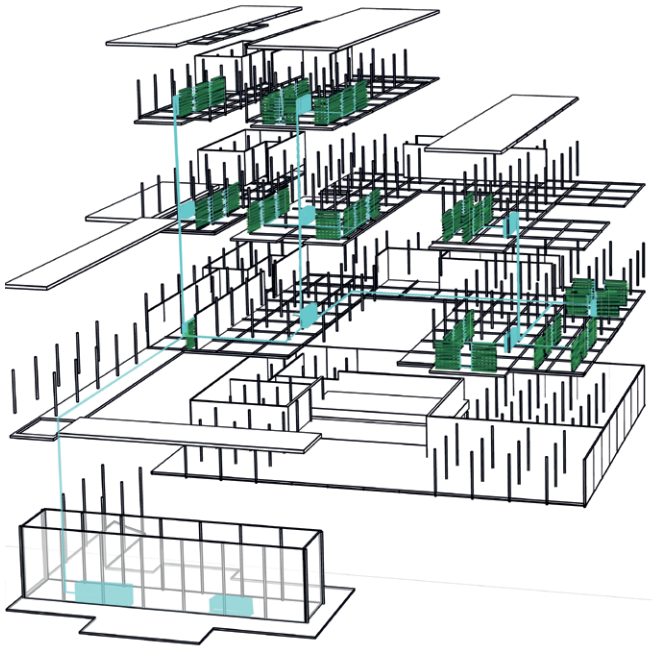
I PREFER TO THERMOCHROMIC FACADE DESIGN SINCE THE SOUTH FACADE IS VERY BIG AND THE BUILDING IS LOCATED IN THE MIDDLE OF THE GREENERY AND NEARBY THE WATER, I WANTED TO MAKE IT MORE DOMINANT AMONG THEM. THE FACADE IS CHANGED ACCORDING TO TEMPERATURE OF THE SUNLIGHT. IT INDICATES WEATHER DIFFERENCES BY CHANGING COLOUR. THE USE OF THREE DIFFERENT COLOR(YELLOW, GREEN AND BLUE) CHANGES OVER THE THREE DIFFERENT TEMPERATURE RANGES. THIS RESPONSIVE FACADE HELPS PLANTS TO GET OPTIMUM SUNLIGHT, NOT DIRECT LIGHT. WHERE THE SUNLIGHT HITS THE SURFACE MOST, THE AREA TURNS DIFFERENT COLORS AND LAYER BELOW IS DECREASING ITS TRANSPARENCY BECAUSE DIRECT SOLAR RAYS COMING ARE NOT USEFUL FOR PLANTS.

5°- 15° → BLUE
15°- 25° → GREEN
25°- ∞ → YELLOW









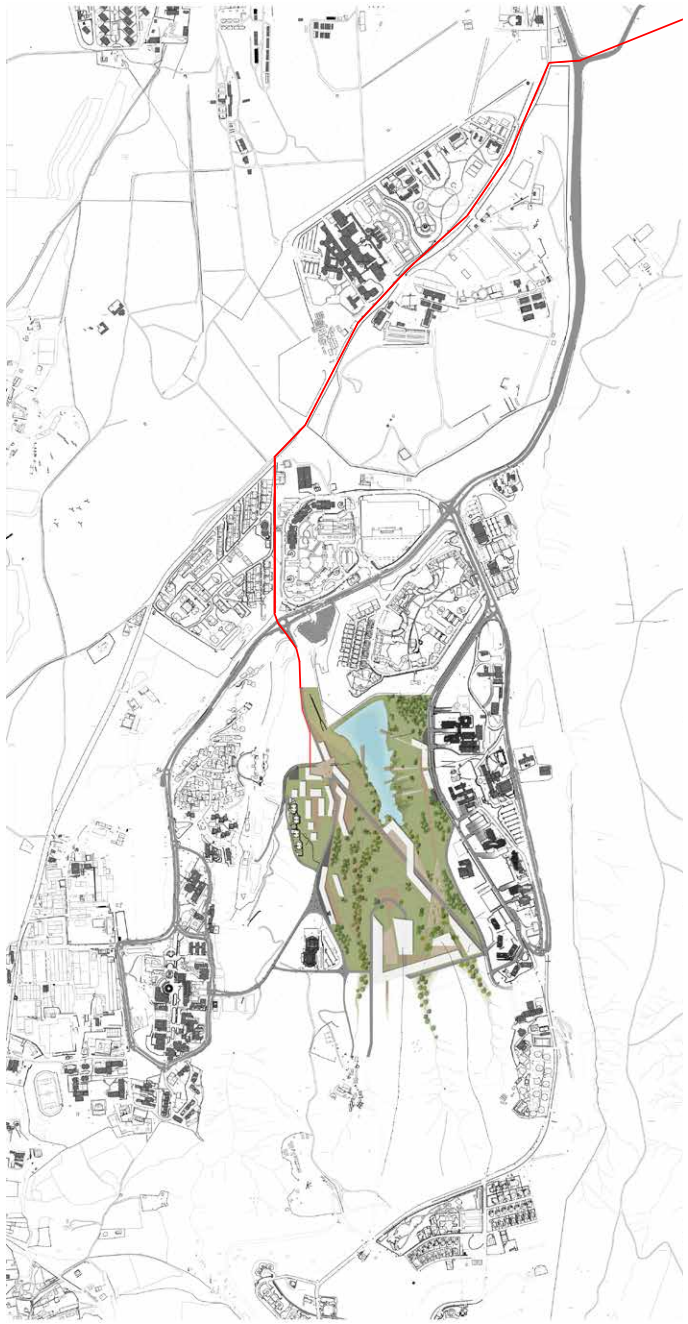
SINCE THE SOIL TYPE IS NOT APPROPRIATE FOR DOING AGRICULTURE IN SOIL, IT IS MUCH MORE USEFUL TO DO HYDROPONIC AND AQUAPONIC SYSTEMS IN VERTICAL GARDENS. THERE IS NO SOIL, INTEAD OF SOIL, THERE IS ONLY THE WATER, WHICH IS COMING FROM THE FISH AND ALGEA FARMING IN THE WATER. PLANT AND FISH GROWS TOGETHER IN ONE SYSTEM. THE FISH PRODUCED WASTE AND IT IS USED FOR ORGANIC FOOD SOURCE FOR PLANTS

THE AQUAPONIC CENTER IS LOCATED ON A DECK ON THE WATER AND THE SOLUTION-BASED WATER ARE TRANSMITTED TO THE PLANTS WITH THE WATER TUBES WHICH ARE SEEM LIKE A STRUCTURAL MATERIAL. I ALREADY HAVE 4M*4M STEEL STRUCTURAL SYSTEM AND IT HELPS PEOPLE TO SEE WHAT'S GOING ON. SOME COLUMNS ARE USED STRUCTURAL PURPOSE, SOME ARE USED AS WATER TUBES.

INTERDISCIPLINARY CAMPUS EXTENSION

DEMRE ERTEM, DAMLA TARMAN, ZÜMRÜT NABIYEVA

In-between two neighboring campuses and in the middle of the two parts of Bilkent, the project envisions a hybrid environment for interdisciplinary research practices; a smart and ever changing campus extension for research and production.



Becoming a new campus

The site of the Project is the surroundings of Bilkent Pond. Since Bilkent university is located in-between METU and Hacettepe campuses, having a connection between those universities was the first idea came to the mind. After getting detailed analysis it was evident that the site's configuration in-between the Main Campus and East Campus has a great potential to become an interface between different research institutions. The new campus is envisioned as an academic extension where interdisciplinary research and production can take place.

The formation of the site plan

The site itself can be defined in two parts. The immediate surroundings of the pond is the least constructed area with natural features which should be preserved. Small structures with commercial facilities were decided for the area. İt would work in coherence with the tourism faculty building on the east side and will give socializing spaces on the opposite side as well. Second characteristic part of the site is distinguished from the lake side by a bridge which connects the main Campus with east campus while forming the spine of the campus. The bridge is surrounded by structures and pedestrian walkways. Another vehicle road was designed by eliminating existing problematic road which connected east and main campuses. The road was intersecting topography lines and crossing the flow of the water. It was reversed with a new road way which was following the topography as much as possible and the flow of the water was provided with the bridges crossing it.
The road was developed in a curvilinear form which created the layout of the campus and building locations. Since the site is inclined not everywhere is allowable for construction, and those parts were left as green areas as campus parks with pedestrian ways and small terrace areas.

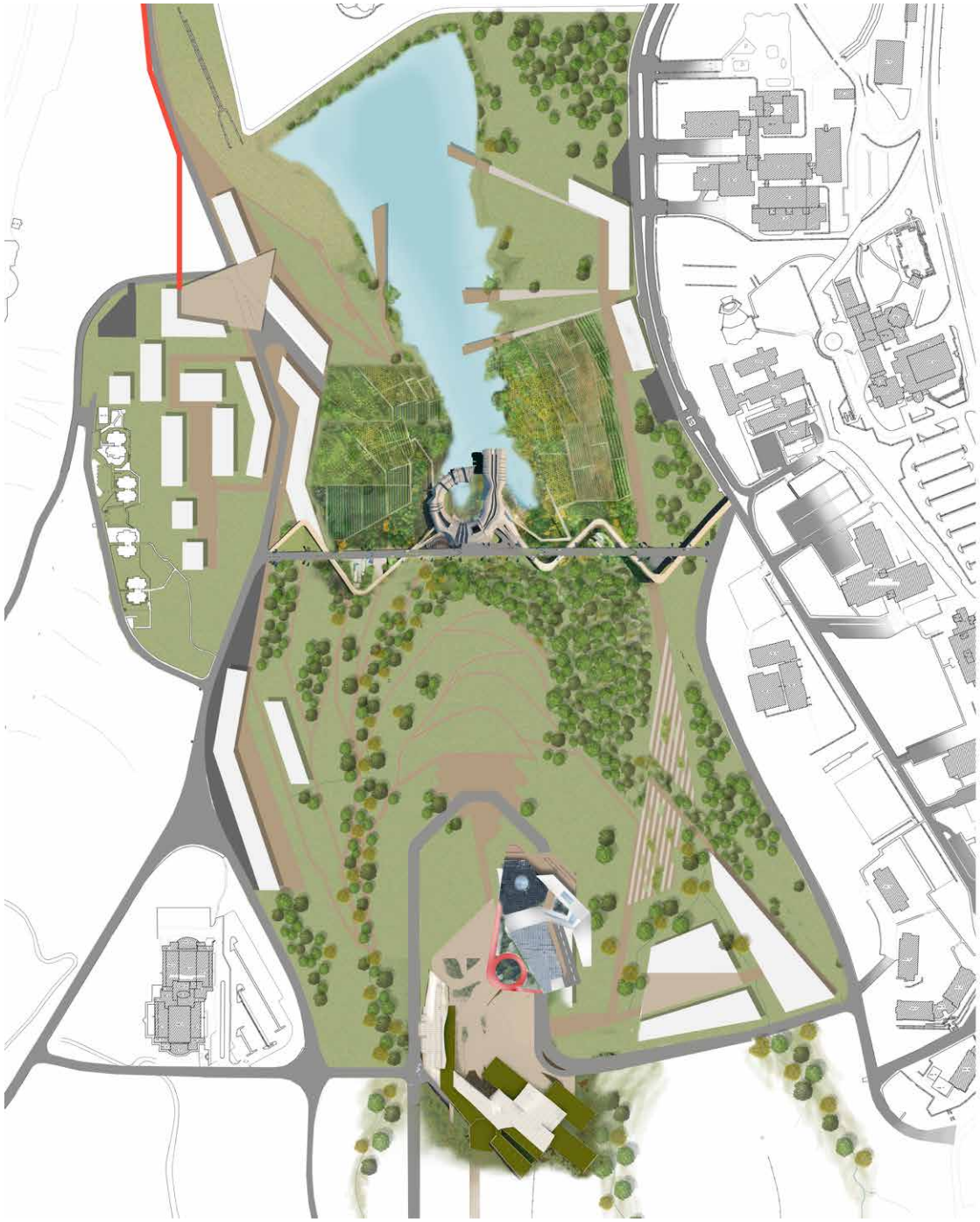
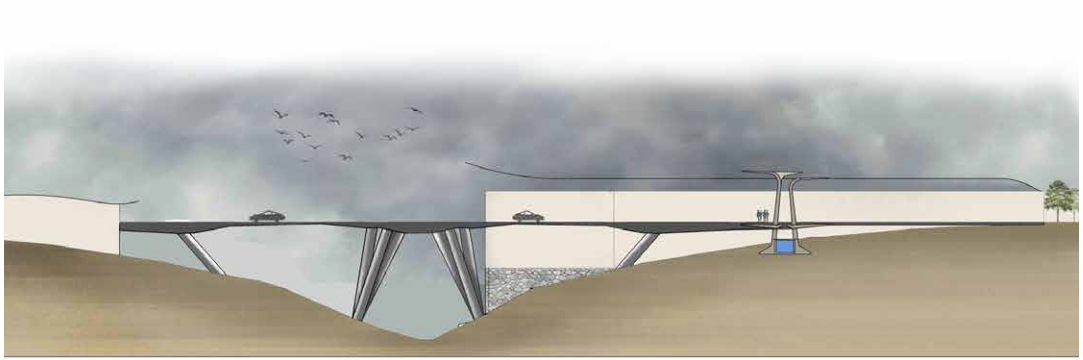


FIGURE GROUND

CIRCULATION

GREENARY



Demand of technological revolution in design process

Architecture refers to the abstract representation of a system or structure. As such, smart architecture defines the organization and interrelation of all potential sub-systems and elements, which deliver all expected smart design services to its audience. This Project aims to get a smart university campus which is sustainable and adaptive at the same time.

In terms of its location and natural features such as having Bilkent pond, level differences thanks to the topography within itself it will give a chance for creating sustainable and nature referred campus. While shaping the programs for the campus buildings the faculties of the existing campus was analyzed and new ones were defined according to the demand. Besides that, new world, technologies and science were the concentration center of research.

Since the technological revolution has affected architecture and the notion of 'space' deeply, in order to create up to date spaces new technological ımprovements and their achievements need to be considered during the process of design.

Multidisciplinary programs of new campus

As the problems science addresses gets more complex various disciplines come together to develop solutions. While the case is like that, multi-functional disciplines for the functions of new faculty would be reasonable. İn this campus different programs are going to be working “under the same roof” in order to achieve up to date solutions.

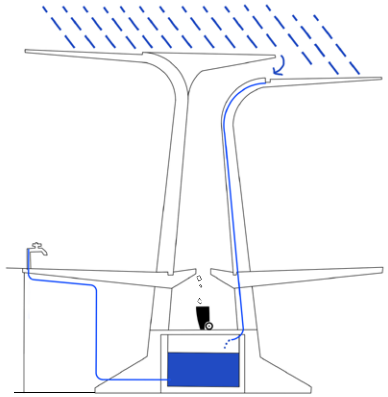
The new campus that focuses on interdisciplinary field is envisioned around hybrid research practices like artificial intelligence robotic construction , aviation, and mechatronics.

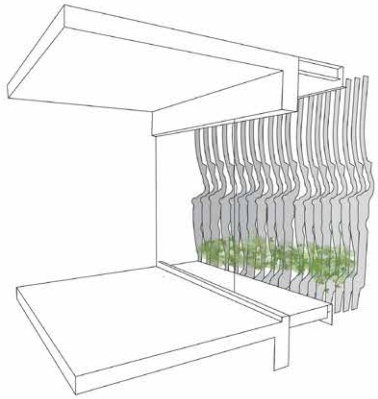
Sustainable features of the new campus

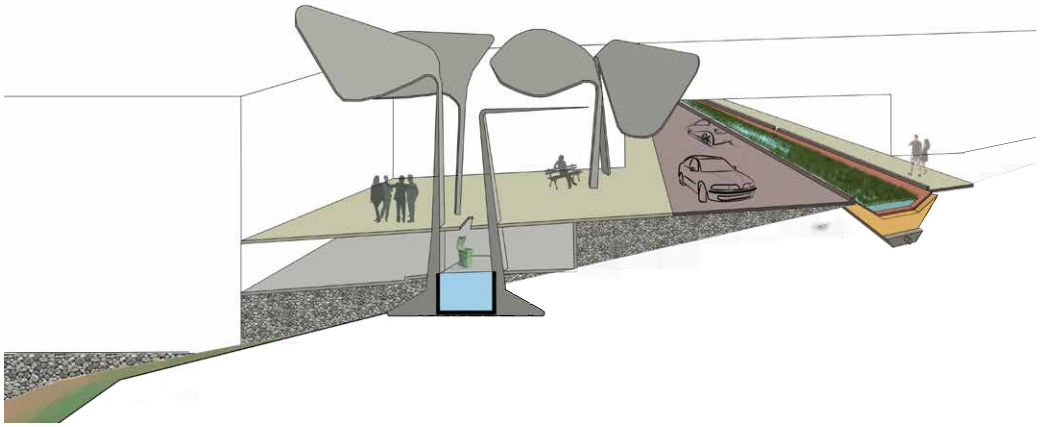
Since the campus is going to have “smart” faculties, the buildings of those faculties need also be designed in a smart way. Thus sustainable features were decided both for the urban features and building facades. Urban rainwater guide was controlled by Bioretention Swale. Bioretention swales are shallow, vegetated, landscaped depressions with sloped sides. They are designed to capture, treat and infiltrate stormwater runoff as it moves downstream. Swales are less expensive to build but use more space for infiltration and conveyance than planters, and can handle low to moderate flows of runoff.

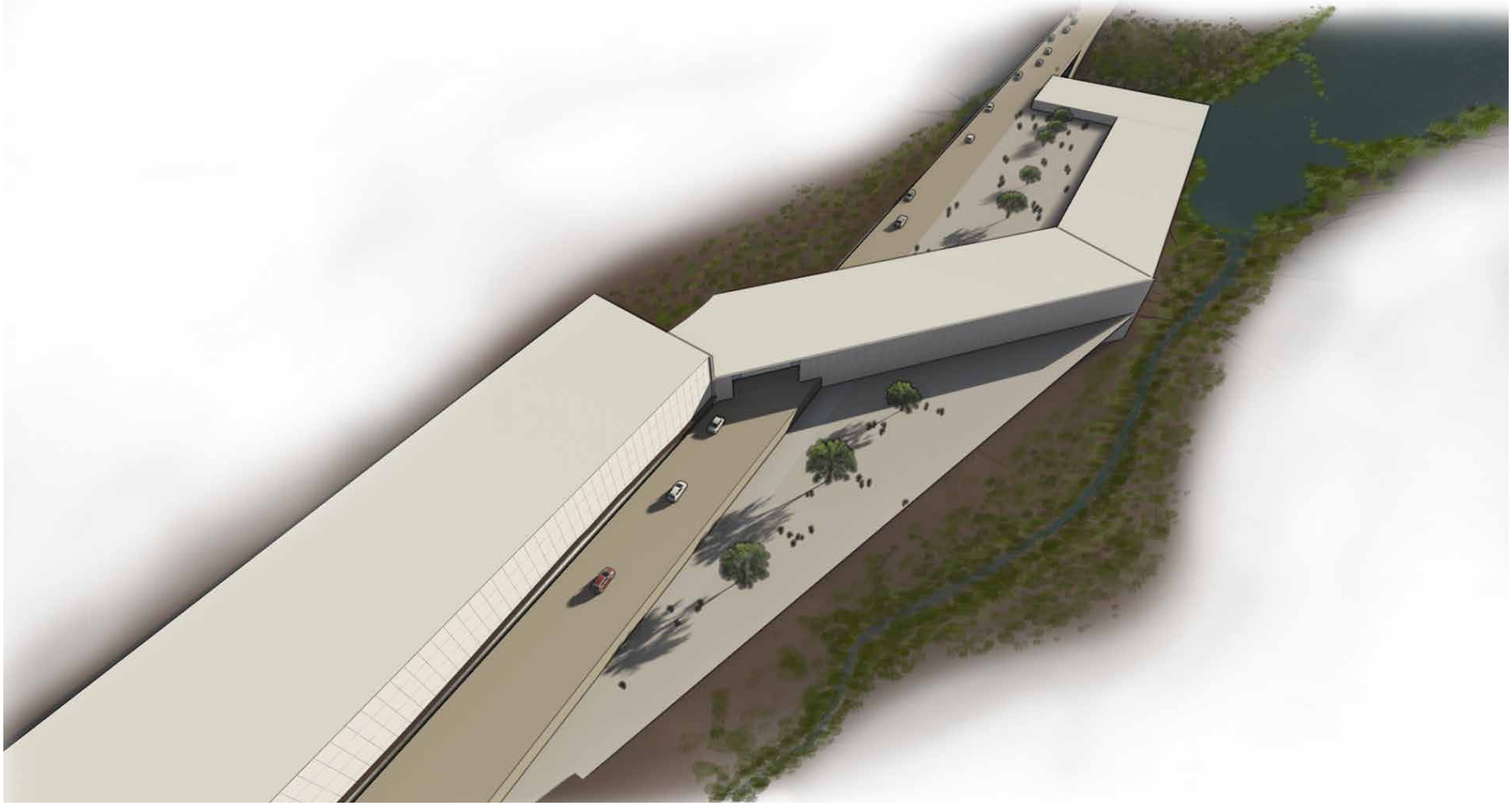
Concrete canopies located on the wide campus squares are another sustainable features. The towering concrete structures would shade the squares from intense sunshine and shelter them from the rain. Rainwater would drain off the surface of the oversized petals and be channelled into underground storage tanks so it could be reused for cleaning the paving in the square or for flushing the new public toilets.

The facades of the buildings are going to be designed in adaptive way to the environment. This system is based on the fact that wastewater carries nutrients necessary for plant growth, such as nitrogen and phosphorus. By looping grey water through the facade panels and their embedded plant beds the grey water will be cleaned enough to be either dispersed directly into the environment, or used for toilet flushing and local irrigation.









DEMRE ERTEM

DESIGN FACULTY

Considering current state of architectural studies, the emphasis on fabrication and combining education with hands on studies is one of the main trends nowadays. This trace of research and education is partly present in our own context but needs the necessary infrastructure for it to develop further. To keep up with the new generation, modern innovative architecture faculties are in need. This faculty meet the needs with holistic learning space in Bilkent University that support innovation and creative thinking about design issues with an interdisciplinary perspective.

The building that is Architecture Faculty with a design factory as a continuation of the existing campus. There are spaces for three disciplines which consists of Architecture, Civil Engineer, Urban Design. These departments always work with each other and realize their works physically in the industrial part with comprehensive projects. The faculty is not only for the multidisciplinary works, and also fabrication space which provides interaction between student and industry.

There are three important hubs which are theory, warming and practice in this faculty. Theory hub works with three disciplines separately and creates their own ideas. Faculty places is for getting inspiration while brainstorming and getting knowledge from the instructors. Then, they meet each other in the debate part to get in discussion with students from the other discipline with the help of the lectures, workshops, seminars, collaborative studies and juries.

Warming space, is the previous step before the practice. The place also consists of the social attractions. In order for students to feel like in their second home where it is allowed to have fun, experiment, fail fast and learn from mistakes, social points are brought up to relax and feel free and share their personalities. We can called that “Blank” acts like a regeneration or recharging places for students and researchers. Some rooms give teams a space where they can focus on work for multiple days in a row without having to clean up and rearrange in between.

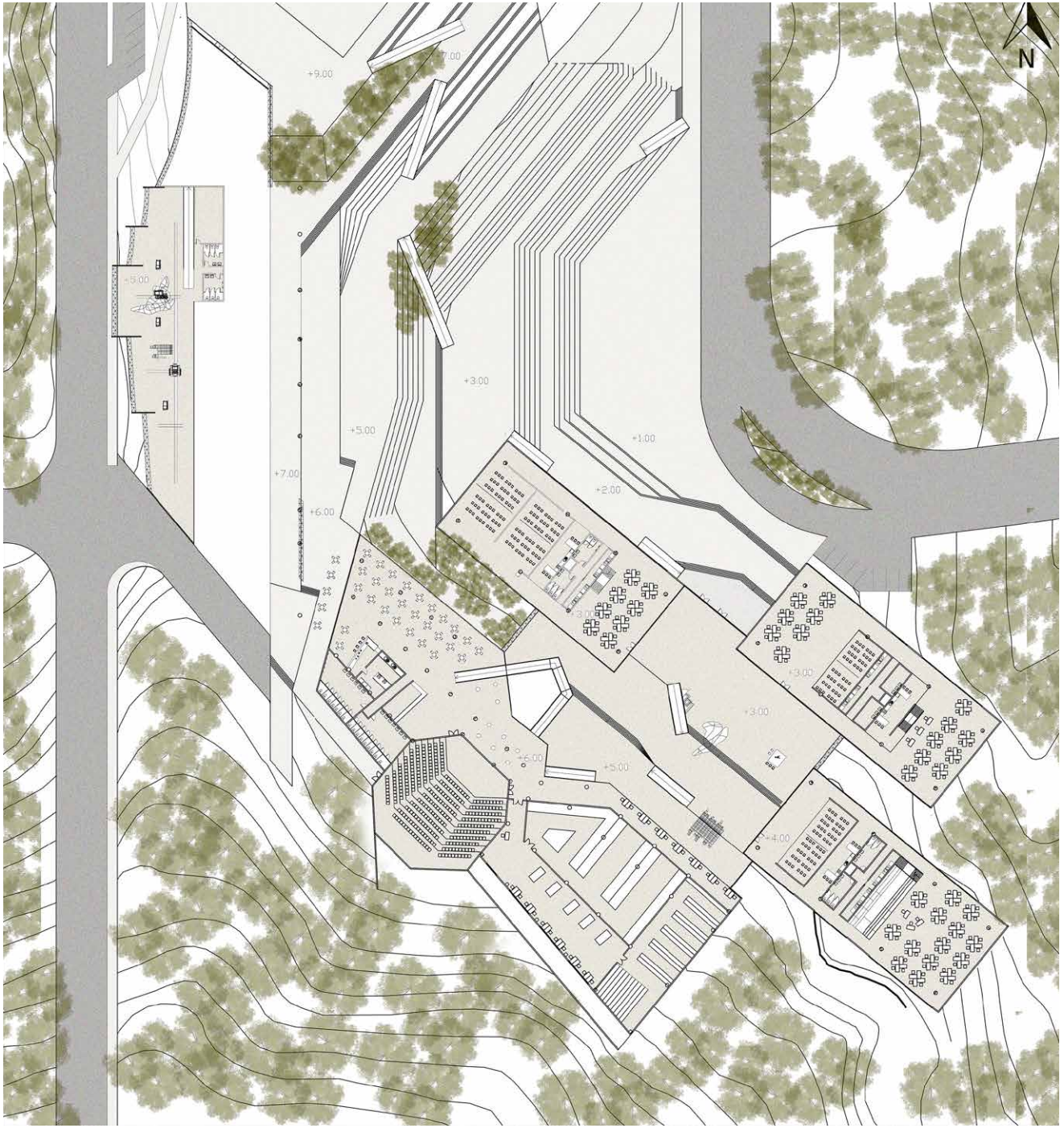
The third part is the fabrication hub which provide visualizing, prototyping and experiments for both students and researches. The fabrication area is not only to work with other disciplines, but also to work with people who Works in the industry. This hub consists of machineshop, printshop, electroshop, woodshop to serve students.

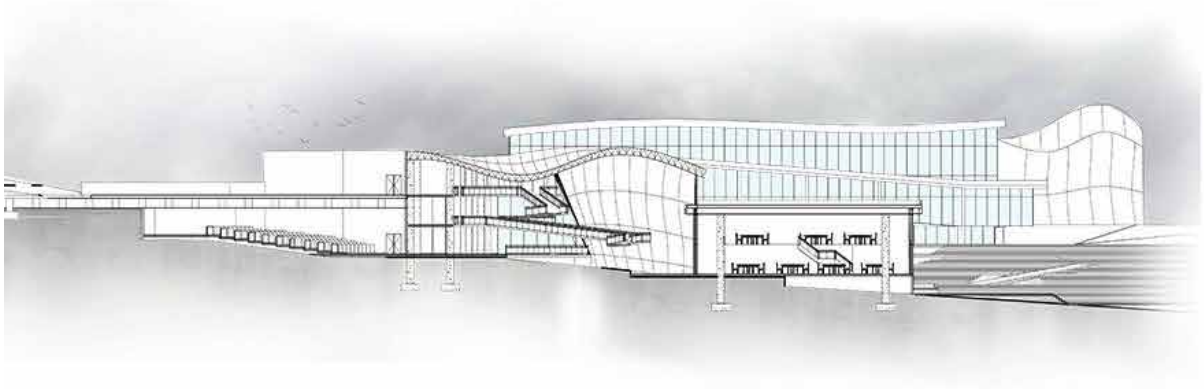
Site Analysis

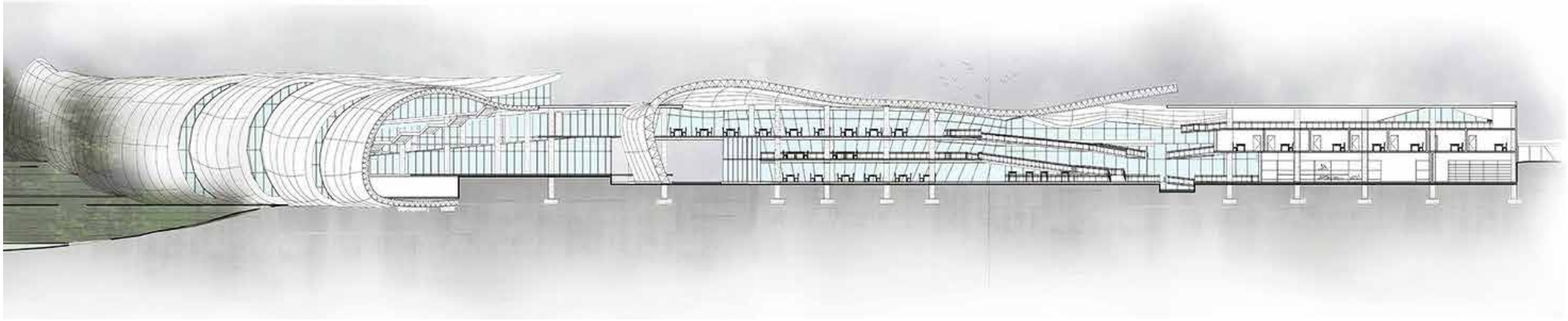
Main mass emerged with consideration of the existing site ideas which are proposing the faculty extension. The structure starts in between two hills with the fabrication space mostly settled exactly at the middle of the area to take advantage of the flatness of the topography and the educational part continue in the skirts of the hill to make use of the terraced structure to have a lot of open spaces in each level.These two parts are apart from each other to minimize the sound of the machines. The warming part was very helpful to connect them together. It is a kind of bridge like between the school life and business life.

I arranged two different roof system according to the need of the big spaces. While one way slab will be used in green roofs upper part of the lecture holes and the studios, space frame structure was used in the dynamic roof to get bigger span. These two different structure will be integrated each other to emphasize of the interaction between the environment and technology.
The technology is merely a tool whilst real learning happens by the experiences one encounters within the spatial journey of the building. The platforms and railing system will help to create different spaces with the help of the technology in fabrication part. Also, in the studio areas prefabricated simple units are designed to provide temporary, meeting, storage and sleeping spaces. Open plan allow for greater flexibility. Spaces are to be modified, reduced or added as the learning functions changes with time or need.
Environmental

After the consideration of the all building program, the incorporation of passive building strategies enable the faculty to achieve environmental technology. The platforms that were created to have changeable spaces also embraces the terraced site by the strategic functions being tucked into the ground. The organization enables the entire building to be naturally ventilated and utilizes the green roofs to capture solar energy. Light wells capture and deliver daylight to the areas submerged in the ground.
The manipulation of the terrain and form enables rainwater to be harvested for Daily consumption and waste water to be treated and reused for landscaping.
There are also yards in between lecture and studio spaces to get more natural light to the spaces and natural ventilation. Also the yards give opportunity for students to work outside.

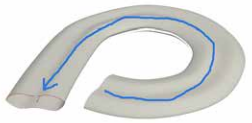




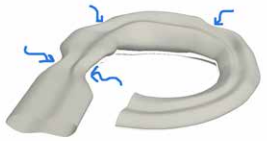


DAMLA TARMAN

ECO-DRONE SCIENCE and TECHNOLOGY CENTER



A ROUND FORM DESIGN BY CONSIDERING THE SLOPE OF THE TERRAIN DOWN TO MAKE IT COMPATIBLE WITH IT.

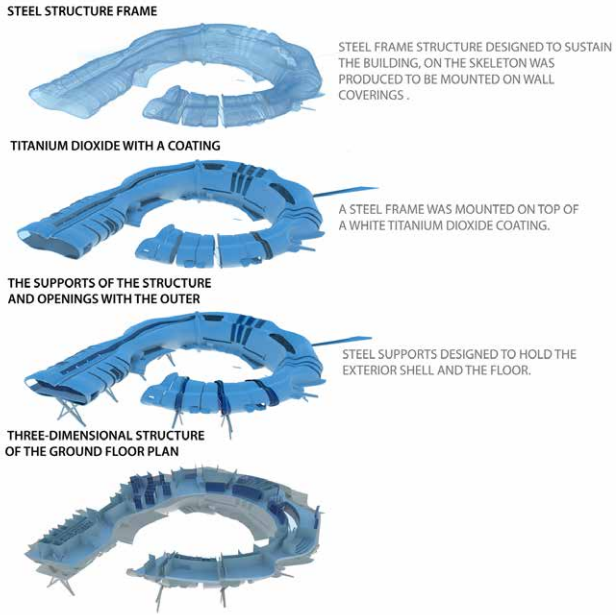


OPEN PLATFORM AND ENTRANCES ARE NEEDED FOR THE BREAKAGE OF FORM IN PLACES WHERE THE ROUND IS PUSHED.

OUTSIDE THE AREAS FORMED BY THE ROUND FORM OF THE PUSH PLATFORM IS EXTENDED, AND OUTDOOR ON THE TERRACES OCCURRED. THE STRUCTURE OF THREE-DIMENSIONAL HOLES OPENED IN THE ROOF TO CREATE OPENINGS.

The Eco-drone science and technology center is located on south part of the Bilkent pond. The aim of Eco-drone science and technology center is using the best sustainable energy in the production, testing exhibition of environmental friendly drones in order to have more green future. In the developing world, the bringing's of technology has brought major contribution to the sustainable scope of use. The drone functions consist of four main subjects which are deforestation, agriculture, wildlife and underwater. Briefly, the drones which are produced in the eco drone science and technology center is working for sustainability. The project has many sustainable solutions which are rainwater collection system that is located between skylights, smart windows, solar panels that are placed on south part of the building, smart speed bump on the vehicle road. In addition the drones which are producing in the eco drone center has solar panels top of the drone structure, therefore the drones use renewable energy.

The side platforms that have placed on test studio are designed for drone exit platforms. The drone races are held in the center during the certain times of year. The platform which is located under the building has many audiences during the drone race. The material of the shell is titanium dioxide which cleans weather and itself. The main structure consists of steel frame which helps to stand the building. Steel feet support the shell of the building and floor. The bridge that connects the east and main campus is used as the way to vehicles. The ramps are created from vehicle road to the building in order to receive service inside. Environmentally friendly, no smoke and without creating noise which is a form of transportation bike path for bicycles is designed at the lower level of the bridge. Pedestrian path next to the bike path, under the vehicle road level is designed. Green terraces which are located near the pedestrian road created for pedestrian in order to rest.



OPEN PLATFORM

TEST STUDIO IS DESIGNED WITH THE DRONE OF THE PLATFORM EXIT TRANCE IN CASE OF OPEN SPACE IS USED. PLANTING LAND DRONE TEST WAYS TO USE THE REST OF THE PLATFORM TO REACH THE AREA.

STRUCTURE-BOUND PLATFORMS

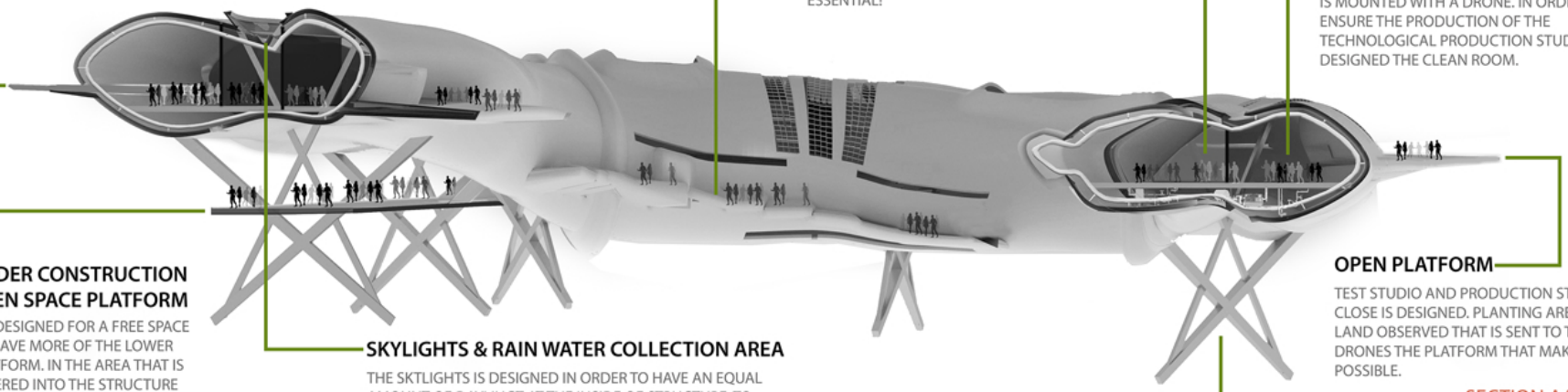
STRUCTURE INTEGRATED WITH PLATFORMS BESIDES TURNING TO THE STAIRS HAS A BEAUTIFUL VIEW OF THE LAKE.

SCIENCE AND TECHNOLOGY WORKSHOP

PUBLIC PARTICIPATION THE ENVIRONMENTAL IMPACT OF SCIENCE AND TECHNOLOGY ASSOCIATIONS THAT CAN PROVIDE THE WORKSHOP WHERE EDUCATION IS GIVEN AND EXAMINED. THE SUSTAINABILITY OF THE FUTURE TO INFORM AND TO BE INFORMED IS ESSENTIAL!

DRONE PRODUCTION STUDIO

ENVIRONMENTAL-FRIENDLY DRONES DESIGNED IN THE PRODUCTION STUDIO. THIS STUDIO IS PLACED NEAR THE TEST STUDIO AND OPEN PLATFORM. THE PRODUCTION OF SOLAR PANELS TAKES THE PLACE OF WHERE IT IS MOUNTED WITH A DRONE. IN ORDER TO ENSURE THE PRODUCTION OF THE TECHNOLOGICAL PRODUCTION STUDIO DESIGNED THE CLEAN ROOM.



UNDER CONSTRUCTION OPEN SPACE PLATFORM

IT'S DESIGNED FOR A FREE SPACE TO HAVE MORE OF THE LOWER PLATFORM. IN THE AREA THAT IS ENTERED INTO THE STRUCTURE FROM THE PEDESTRIAN PATH TO THE PLATFORM TRANSITION CAN BE MADE. EDITED DRONE CREATES FREE SPACE TIMES THE VIEWERS OF THE RACE. I CAN SOCIALISE FANS TO THE SPIRIT OF THE AUDIENCE PLATFORM MAKES IT A RESIDENCY.

SKYLIGHTS & RAIN WATER COLLECTION AREA

THE SKTLIGHTS IS DESIGNED IN ORDER TO HAVE AN EQUAL AMOUNT OF DAYLIHGT AT THE INSIDE OF STRUCTURE. TO BENEFIT FROM DAYLIGHT HAS A BIG CONTRIBUTION TO SUSTAINABILITY PROCESSES. SKYLIGHTS IN THE ROOF TO COLLECT RAIN WATER PART OF THE WATER COLLECTION WAS DESIGNED. COLLECTED RAIN WATER WITH THE HELP OF THE PIPES IN THE BOTTOM OF THE WATER TANK IS DELIVERED.

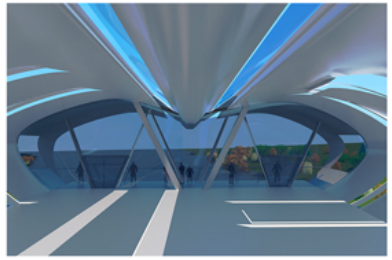
STEEL STRUCTURE LEGS

DESIGNED INTERLOCKING THE STRUCTURE OF FEET, THICK FEET SUPPORTS THE BUILDING SHELL WITH THIN FEET SUPPORTS THE FLOOR AND THE ROOF, THEY ARE VISIBLE INSIDE OF THE STRUCTURE.

OPEN PLATFORM

TEST STUDIO AND PRODUCTION STUDIO CLOSE IS DESIGNED. PLANTING AREAS OF LAND OBSERVED THAT IS SENT TO THE DRONES THE PLATFORM THAT MAKES IT POSSIBLE.

SECTION AA' 1:200



3D DRONE SHOWROOM

DRONE 3D SHOWROOM IS DESIGNED WITH SURROUNDED WIRE MESH FENCES IN ORDER TO PREVENT DRONE ESCAPING TO ANOTHER SPACE. THE SHOWROOM IS DESIGNED ON TOP OF THE SKYLIGHT. THE SKYLIGHTS ARE OPENED DURING SHOWTIME TO BEING SET FREE. SKYLIGHTS PROVIDE HEAT AND LIGHT OF THE PLACE REGULATIONS.

SEMI-OPEN PLATFORM

DRONE PLATFORM RACES ON THE LAKE BECAUSE THIS IS DONE, TIME TO RACE IN CONTESTANTS AND VIEWERS RESIDENCY. THE PLATFORM HAS TWO SEPARATE OUTPUT AS THE CONTESTANTS AND VIEWERS FROM THE DOOR RESERVED. OPEN WHEN NOT RACING AS THE PLATFORM IS USED.

THE CORRIDOR OF THE AUDIENCE

CORRIDORS CONSCIOUSLY WIDE IS DESIGNED. IN THE HALLWAYS OF THE PROTOTYPE DRONES IT WAS THOUGHT THAT THIS EXHIBIT STANDS.

STEEL STRUCTURE FRAME

STEEL FRAME HOLDS THE STRUCTURE AS A CAGE, TITANIUM DIOXIDE COATING OF THE PLATES IS MOUNTED TO THE FRAME.

ORIENTED WINDOWS

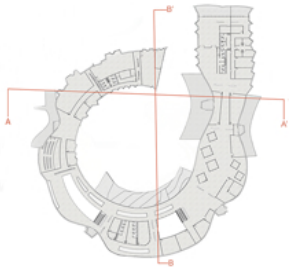
EAST AND WEST OF THE LIGHT IN THE WORKING ENVIRONMENT IS VERY EFFICIENT IN TERMS OF SUSTAINABILITY. THE WINDOWS ON THE EAST AND WEST FACADES IN MIND NOT DIRECTED TO THE NORTH. THE BACK OF THE WINDOW (SOUTH SIDE) TO MAXIMISE SUSTAINABLE ENERGY SOLAR PANELS ARE DESIGNED AND AIMED.

IN THE AREA OF BUILDING INSTALLATIONS

PLUMBING SYSTEM WITHIN THE STRUCTURE SOLVED ARE STORED IN THIS AREA. ELECTRICAL, MECHANICAL FIXTURES ARE SOLVED, THE AREA WHERE ALL THE PIPES RUN AND OF SETTLING.

DRONE TEST STUDIO

THE DRONE TEST AREA IN -1.LEVEL CLOSE TO THE DESIGNED 3D DRONE SHOWROOM. THE SKYLIGHT IS OPENED IN SHOWTIME DRONES LIBERATES. ORIENTATION IS PROVIDED FROM THE TEST STUDIO AND THE AUDIENCE HAVE A VISUAL DRONE SHOW PERFORMANCE.



SECTION BB' 1:200

THE AIM OF ECO DRONE SCIENCE AND TECHNOLOGY CENTER IS USING THE BEST SUSTAINABLE ENERGY IN THE PRODUCTION, TESTING AND EXHIBITION OF ENVIRONMENTAL DRONES IN ORDER TO HAVE MORE GREEN FUTURE. SUSTAINABILITY IN THE DEVELOPING WORLD THE NATURE OF TECHNOLOGY HAS BROUGHT MAJOR CONTRIBUTIONS TO THE SCOPE OF USE.

DRONES ARE FLYING FOR SUSTAINABILITY!

DEFORESTATION

THE DRONES CAN PERFORM A SOIL ANALYSIS BY ALLOWING THE CREATION OF REALISTIC 3D MAPS. AFTER ANALYSIS, THE SOIL, THE PLANTING OF THE SEEDLINGS. REGULAR CHECKS ARE MADE ON PLANTED SEEDLINGS AFTER IRRIGATION IN CASE OF NEED PERFORMING. THE FIRST OPTION IS TO USE RAIN WATER STORED IN THE STRUCTURE AS PRESENTED. TAKING AN ACTIVE ROLE IN AERIAL FIREFIGHTING OPERATIONS. REMOTE-CONTROLLED DRONES, SPECIAL BY FREEING IT FROM THE AIR IN THE CHAMBER IS TAKING PART IN THE WATER TO EXTINGUISH THE FIRE.

AGRICULTURE FRIEND

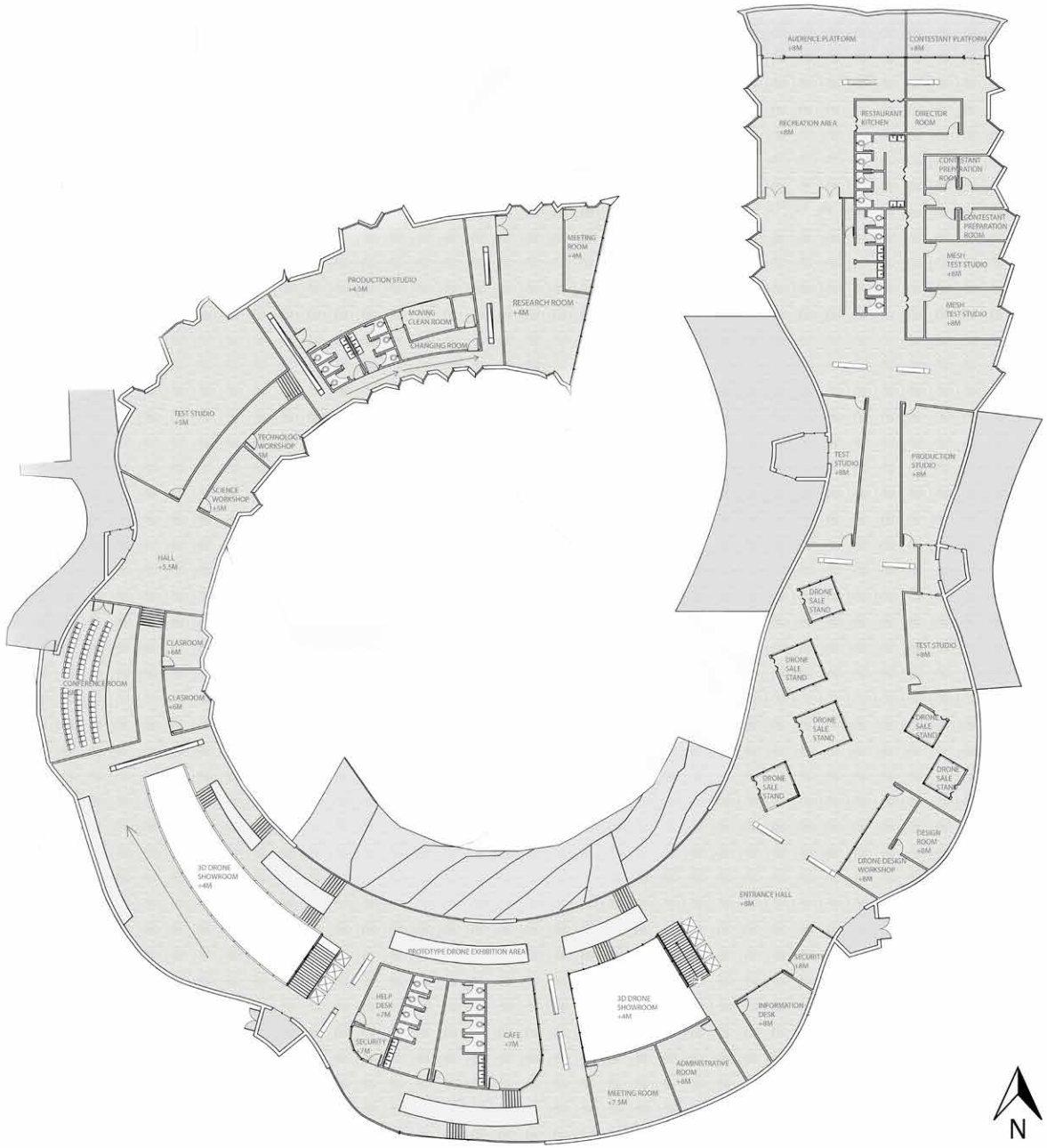
AFTER AN ANALYSIS OF SOIL SAMPLES, PLANTING PROCESS. THEY GET NUTRIENTS DIRECTLY INTO THE SOIL, SPROUTING SEED AND PLACED AS DESIRED. SPECIAL THANKS TO THERMAL SENSORS AND ADVANCED IMAGING TECHNIQUES, AND WHERE PART OF THE LAND THAT NEED WATER WITH NUTRIENTS SHOULD BE SUPPLEMENTED CAN BE DETERMINED. SPRAYING THE RIGHT PLACE FOR THE GROUND THE DRONES DETECTION NEEDS FOR SUSTAINABLE AGRICULTURE THANKS TO ITS ECO-FRIENDLY SOLUTIONS.

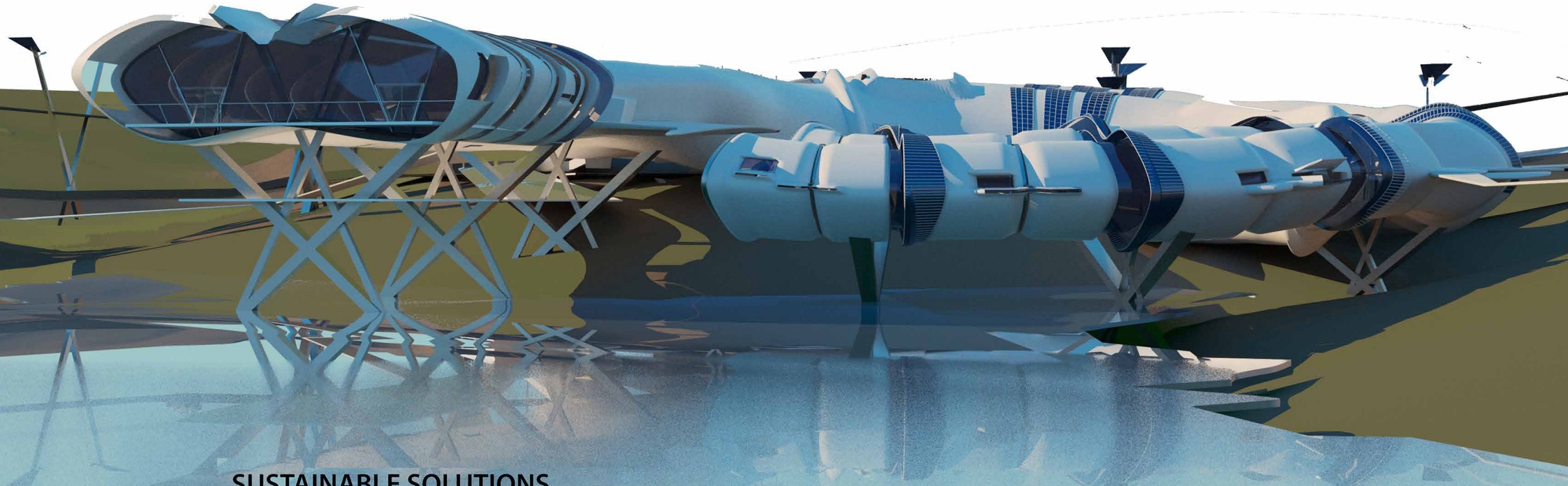
GUARDIAN OF NATURAL HABITAT&WILDLIFE

STAY IN THE AIR FOR A LONG TIME OVER A WIDE AREA WITH THE ABILITY TO SURF THE DRONES PATROL BOTH DAY AND NIGHT PREVENTS POACHING. PLAYS A ROLE IN THE CAPTURE OF POACHERS IN THE FORESTS. MAKES A CONTRIBUTION TO SUSTAINABLE SPECIES. WITH THE HELP OF THE SENSORS OF AIR POLLUTION TO DETECT AND REMOVE FEATURES.

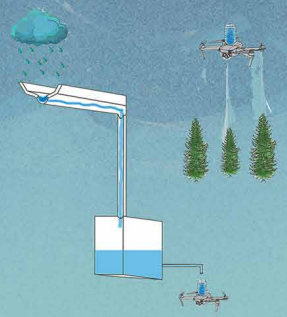
UNDER WATER LIFE OPTIMIZER

THANKS TO ITS PRIVATE SENSORS, LOCATE THE FISH AND FEEDS THEM. THE COLLECTION OF FISH WASTE IN AGRICULTURE AS A FERTILIZER AND ALLOWS IT TO BE USED. FOR THE REPRODUCTION OF FISH EGGS HELPS TO ESTABLISH AN ENVIRONMENT FOR WATER THAT MAY OCCUR. PUMPING OXYGEN AND, IF NECESSARY, MEASURE THE LEVEL OF OXYGEN IN THE WATER IS PERFORMING. WATER POLLUTION AND THE MEASUREMENT OF THE RATE OF CLEARANCE IS INVOLVED.



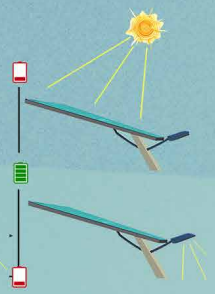


SUSTAINABLE SOLUTIONS



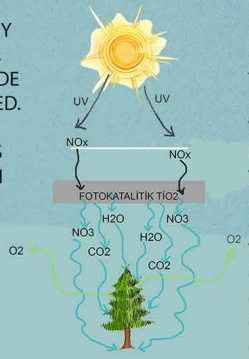
RAINWATER COLLECTION

THE CATCHMENT AREA OF RAIN WATER ON THE ROOF TO COLLECT RAIN WATER BETWEEN THE SKYLIGHTS DESIGNED. COLLECTED RAIN WATER IS STORAGED IN THE WATER TANK AT THE BOTTOM OF THE STRUCTURE. RAIN WATER COLLECTED BY THE DRONES IS USED IN THE IRRIGATION OF AGRICULTURAL CROPS AND FORESTS.



SOLAR PANELS

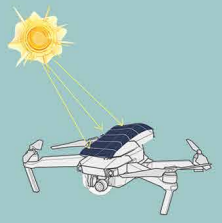
SOLAR PANELS UTILIZE ENERGY FROM THE SUN TO GOOD USE, ESPECIALLY ON THE SOUTH SIDE OF THE BUILDING WERE PLACED. THE SUPPORT OF A DUAL CARRIAGEWAY, STREET LIGHTS AND SOLAR PANELS HAS BEEN ENRICHED WITH. IT WAS TARGETED DIRECTLY OF THE STREET LAMPS WITH SOLAR ENERGY TO WORK.



TITANIUM DIOXIDE COATING

NITROGEN OXIDES IN THE AIR TO CLEAN THE AIR BY NEUTRALIZING A TITANIUM DIOXIDE COATING WAS PREFERRED. WITH THE RAIN COATING THE SELF-CLEANING FEATURE THAT EMBODIES. THE SUN'S UV RAYS THROUGH THE DIRTY AIR IN THE FRONT WHEN IT REACHES AT THE TOP OF THE TITANIUM DIOXIDE COATING, THE COATING IS FORMED BY A CHEMICAL REACTION BETWEEN THE CHEMICALS IN THE SMOKE CHEMICALS. CALCIUM NITRATE, CARBON DIOXIDE AND WATER BREAK DOWN INTO LESS HARMFUL CHEMICALS SUCH AS HELPS.

SOLAR POWERED DRONES

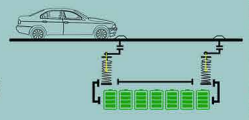


ORIENTATION OF WINDOWS

THE WINDOW IS DESIGNED ACCORDING TO THE STRUCTURE OF AT LEAST THE DIRECTION OF THE DIRECTION OF THE SUN ENERGY IT IS AIMED TO USE. DESIGNED THE FACADES OF WINDOWS FACING SOUTH WITH SOLAR PANELS ENRICHED. HORIZONTAL THIN WINDOW THE OUTPUT WINDOW THE DRONE. OUTPUT IS PROVIDED TO THE TOP PLATE UP AND THE DRONE INSTANTLY.

SMART WINDOWS

SMART WINDOWS WAS APPLIED TO BUILDING FACADES TO PROVIDE SAVINGS IN ENERGY COSTS. SMART WINDOWS CONTROL THE AMOUNT OF LIGHT AND HEAT INTO THE BUILDING WHILE THE WINDOW ITSELF IS ABLE TO RUN THANKS TO TRANSPARENT SOLAR CELLS. TO SAVE HEATING AND COOLING COSTS OF THE



SMART SPEED BUMP

SMART SPEED BUMP AND THE NORMAL BUMP FEATURE CARRIES A DAMPER, AND ALSO THE LAST VEHICLE BUMPS KINETIC ENERGY AND TURNS IT INTO ELECTRICAL ENERGY OF THE POWER OF GRAVITY.

ZÜMRÜD NABIYEVA

MECHATRONICS FACULTY

Since the conceptual idea of our master plan was designing continuity of Bilkent campus by bringing to it a new spirit which is much more technological and modernized. In this term the functions of the new faculty buildings needed to serve to this intention. Thus I decided to design a mechatronic faculty building since this is the young and flourishing section of science and engineering. The meaning of the term mechatronics is combination of two words: mechanics and electronics. On the other side artificial intelligence is the modern power which is starting to conrol all parts of our livings. However, as all of those are wide notions in order to shorten the chamber and having chance to concentrate on one specific function and building type I decided to limit the faculty by the design of "automobiles". Thus, the new building is going to serve for these three engineering branches at the same time which is going to end up with the designs of new automobile prototypes. On the other side, this faculty building is aimed to be as real as possible, so that students could get a chance to experience their knowledges gained from the lectures in the field which becomes possible with another program decided in the building: production process.

Mass formation

The building is designed by connecting 3 which are defined as social, educational and productional zones. Social zone is bringing the educational and productional zones together. On the other side, educational mass is connecting with the production space directly by the computer labs where the brain of the cars is designed.

1. Social area

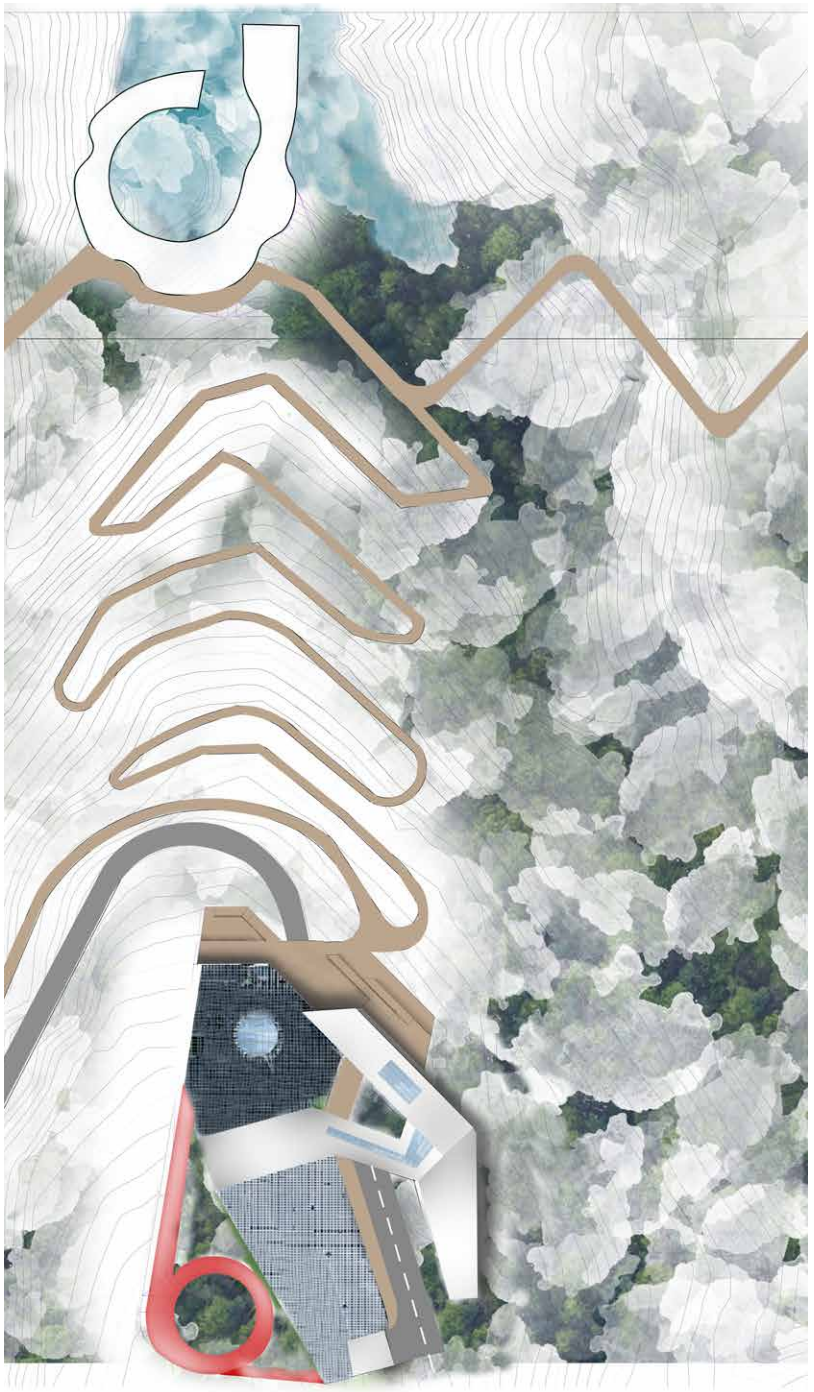
This is the area which is seeing the lake view. The main entrance to the building is given by this area. The social zone is divided into sub spaces according to the topography. In those sub layers which is getting leveled up, there are defined different functions such as a small amfi, café, exhibition area, coworking space. On the other site the mezzanine floors are creating horizontal circulation inbetween the production and educational zones.

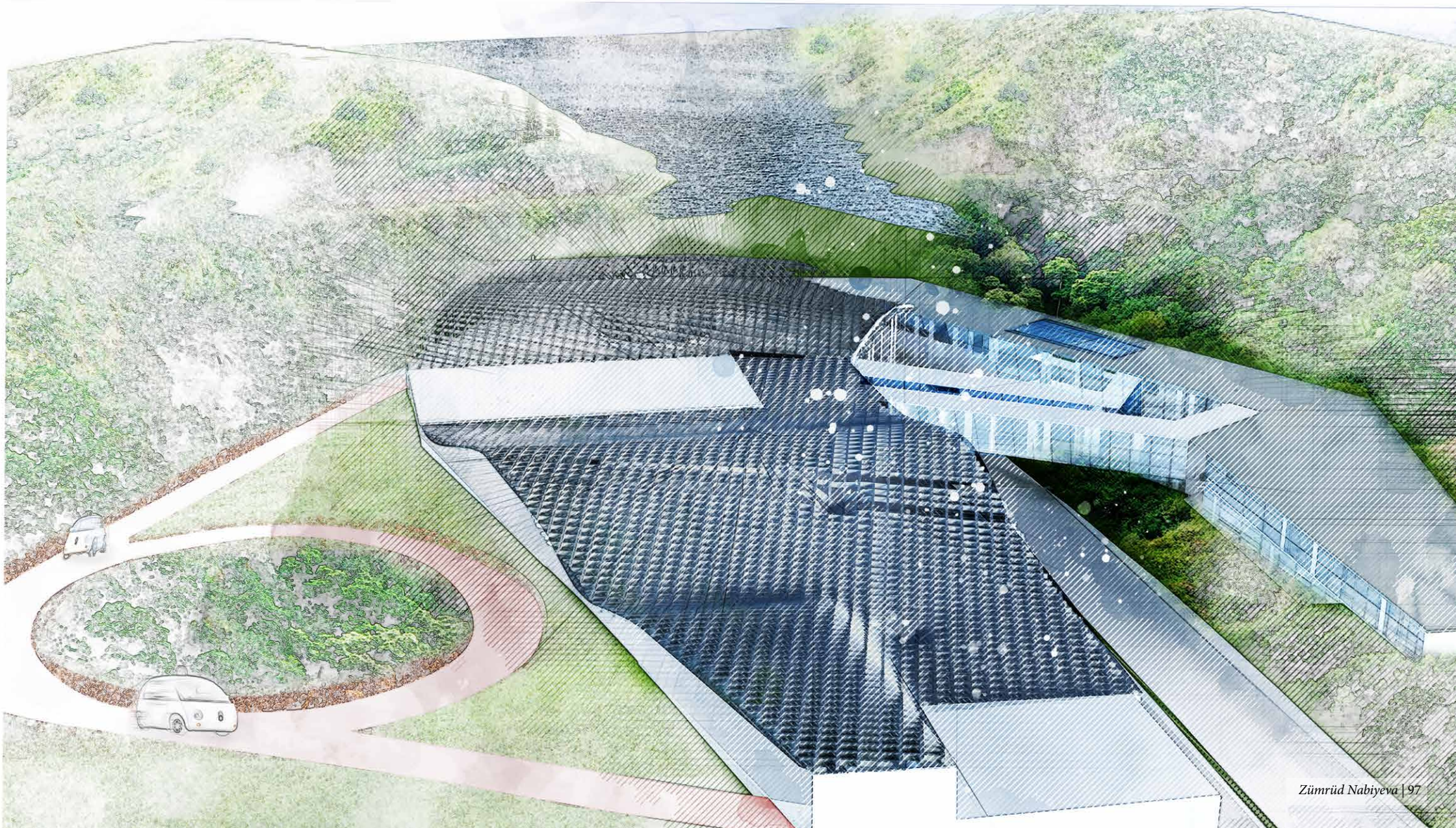
2. Educational area

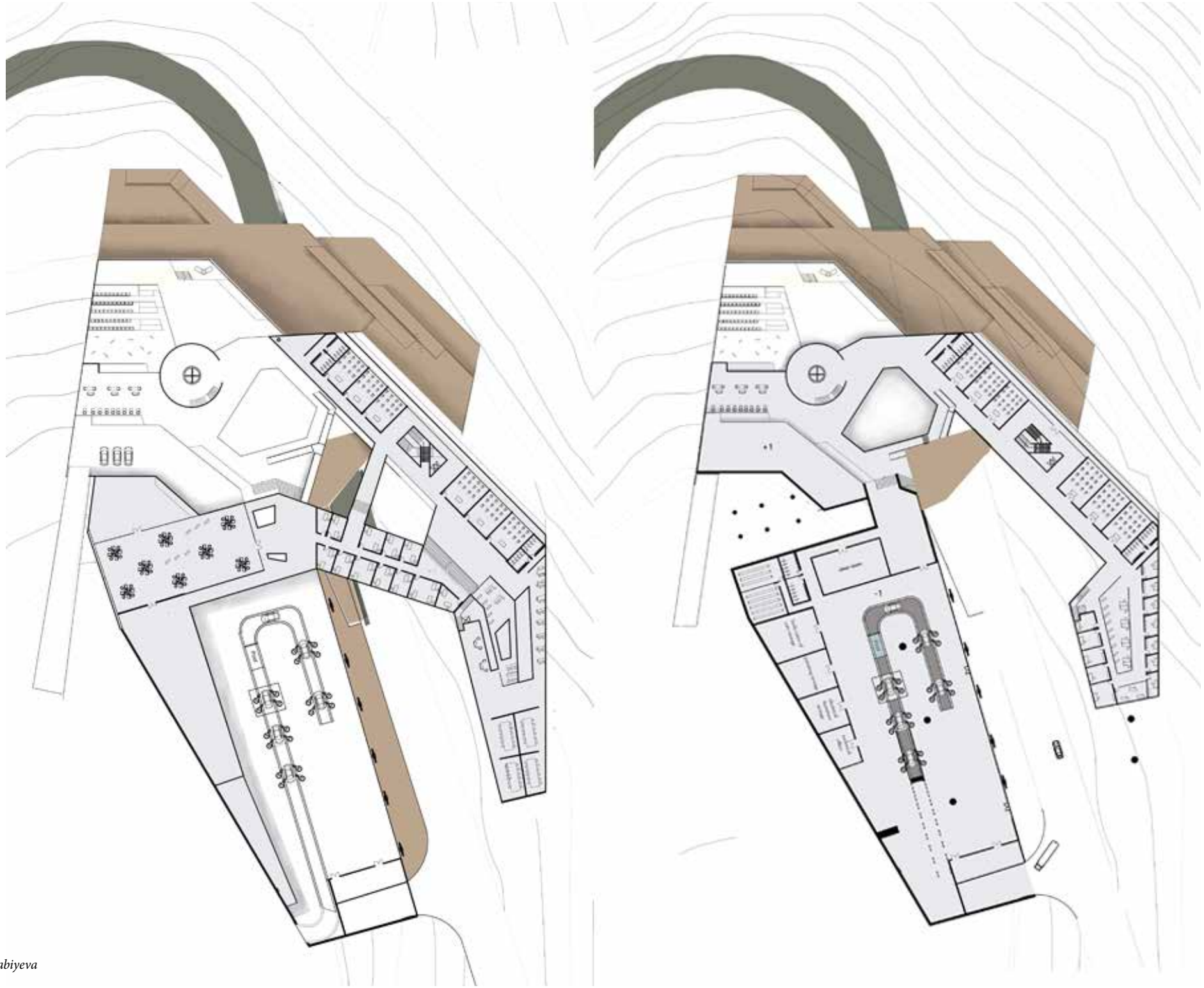
This is the area which is devided in four parts in itself: lecture zone, self study zone, offices, and computer lab. The education part has set backs which follows the topography, helps the sun light and creates small terraces for the lecture halls. The self study area has a small library located in the center and self study rooms. the computer lab is the space which is directly connected to the production area. It is 3 meter higher than the production area which gives a chance for observe the production line.

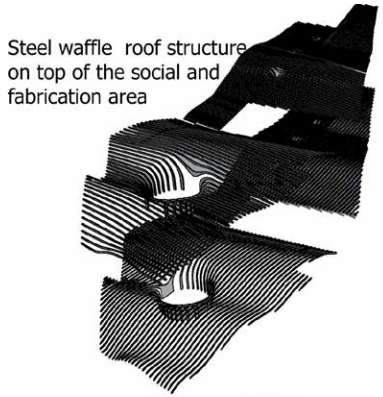
3. Production area

This is the most live space of the building. The space is designed for the car prototype design in both 1/1 car scale, and smaller ones. The cars are going to be designed here will be smart cars which are self driving ones. The production area ends up with a car testing parkour which gets leveling up and leaves the building by going up to the hill. The production space is able to be observed by the lab level, where there are balconies. This makes the production space to become a live exhibition area.

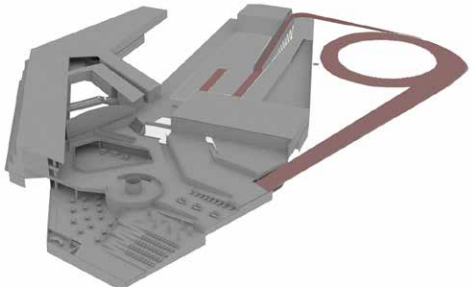








Sustainable reproduced
plastic car road



Car Parkour

Starting from the production space car parkour gets a circular shape which surrounds the hill. After the test ends the car gets driving down with the road going down which ends up connecting to the exhibition area in the social zone. The end product is getting exhibited in this space.

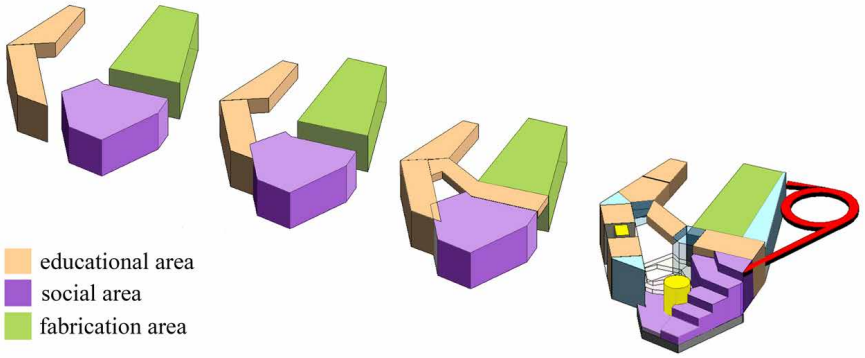
Roof structure of the building

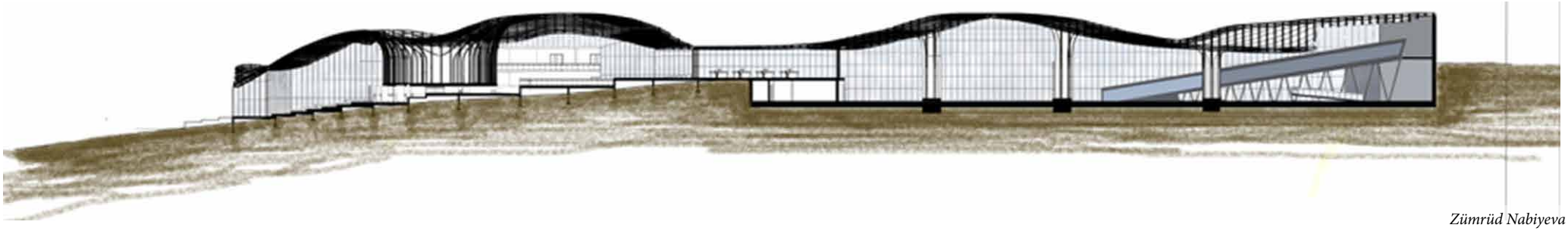
The building has two roof structures. Since the production zone and social zone needs more open and high spaces it is covered with a steel waffle roof structure which gets natural light inside. The roof structure is supported by columns which serve for circulation space in the social zone, and in the production area they have sustainable functions. The educational zones roof is flat roof, according to the needs of the spaces.

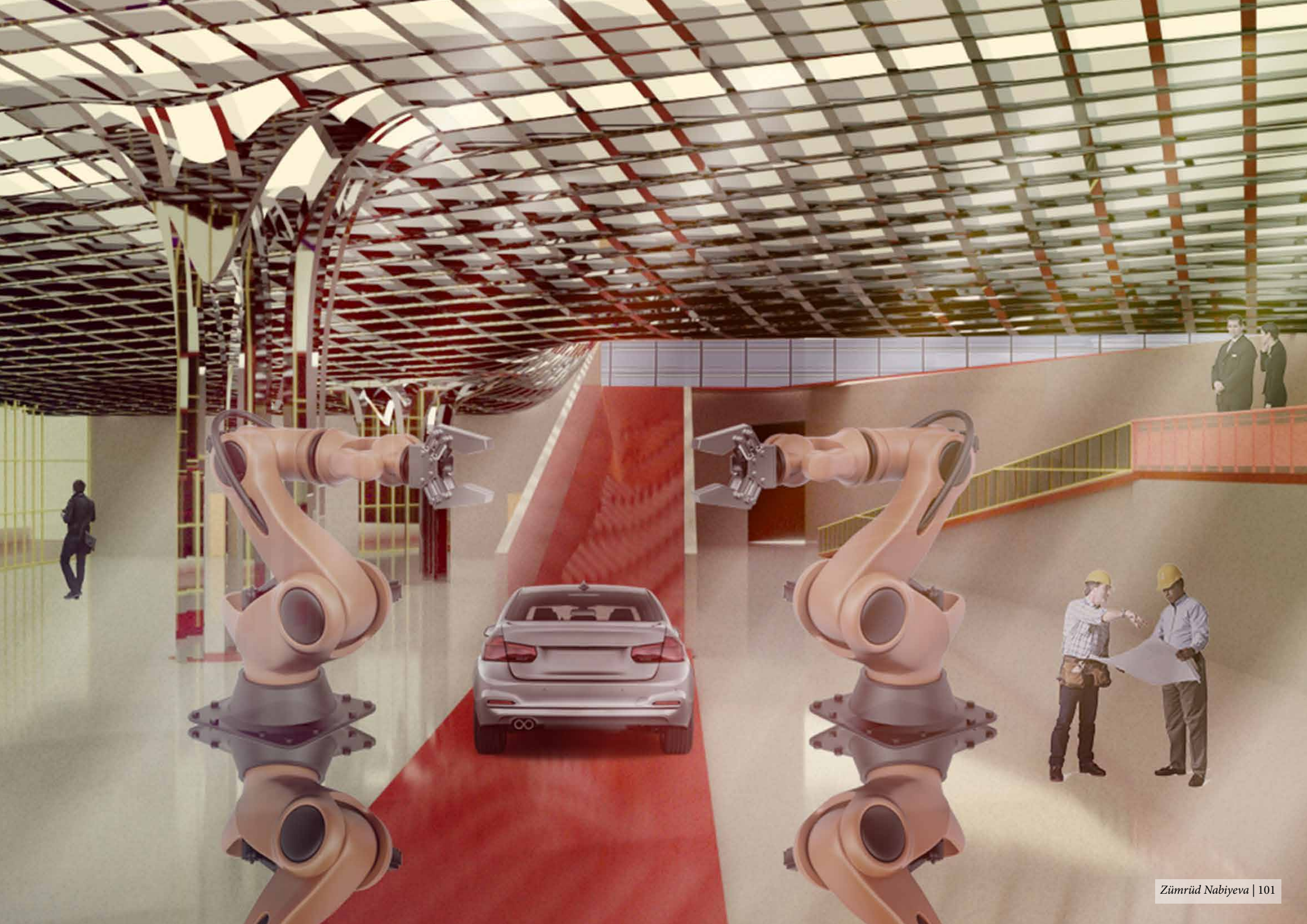
Sustainability in the building

In the production space the roof structure is used for the rain water harvesting. The water in obtained with the columns connected to the roof. The water harvested here is put on the pool which is going to be used for the anti-corrosion of the car.

The material of the car parkour is chosen as recycled plastic, which is much more sustainable and easyes to set. The colour for is is chosen as red in order to stress the systainability and at the same time since there are going to be designed self driving cars which work with electicity, the colour of the road will stress the efficient energy consumption.







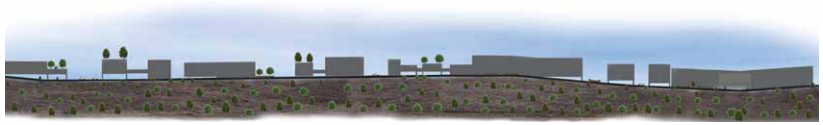
URBAN CORRIDOR without WALLS

F. BETÜL GÜREŞ, CISEM BOZBEK, G. DILARA DEMIRTAŞ,
MELIS ERDEM, SEZGI KIRKIN

Being surrounded by three of Ankara's largest universities, the site shows vast isolation from both its near surroundings and the three universities. Urban corridor without walls, aims to respond to the problems of the site by means of urbanity, sustainability and protectivity. The protection and landscape recovery of the riparian site in the design ideology was prioritized and this has enabled the opportunity to reestablish the already existing nature of the site. Additionally, architectural proposals for the site, not only provide basis for human activity but also create a protective ring that embraces the site throughout. In this protective ring a layered type of urbanity is present.

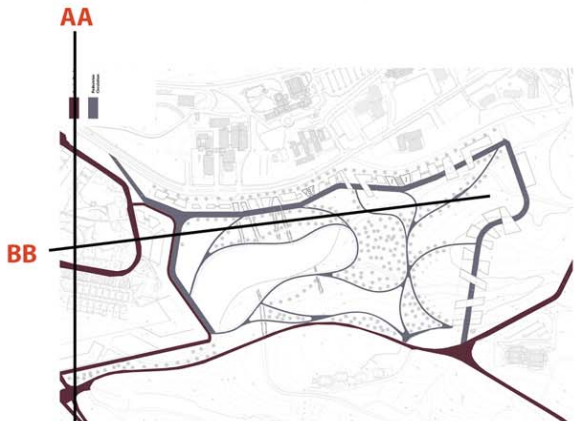
The urbanity being a high density and low impact one, forms basis for sustainability and further enhances the concept of protection. Furthermore, in a site where pedestrians were overruled by vehicles, pedestrian pathways were analyzed thoroughly and new paths were development by means of decks (in order to protect the fauna) and the integration of kinetic pavements to further enhance sustainability. The addition of pine trees as a buffer to the site, not only has disconnected the site from visitors in a very arbitrary way, but it has also resulted in environmental problems. The relocation of the pine trees is crucial for the survival of the landscape recovery.

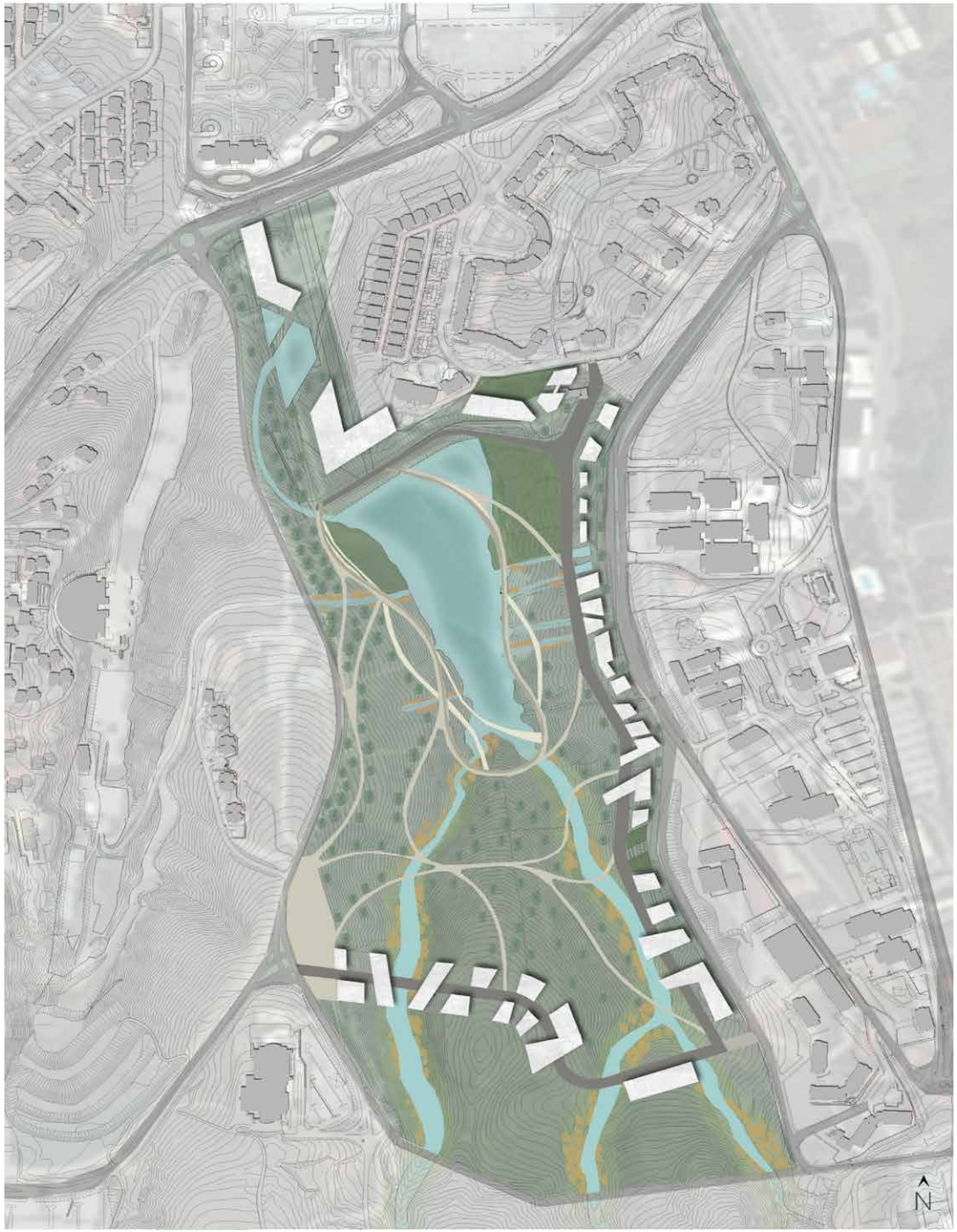
SECTION AA



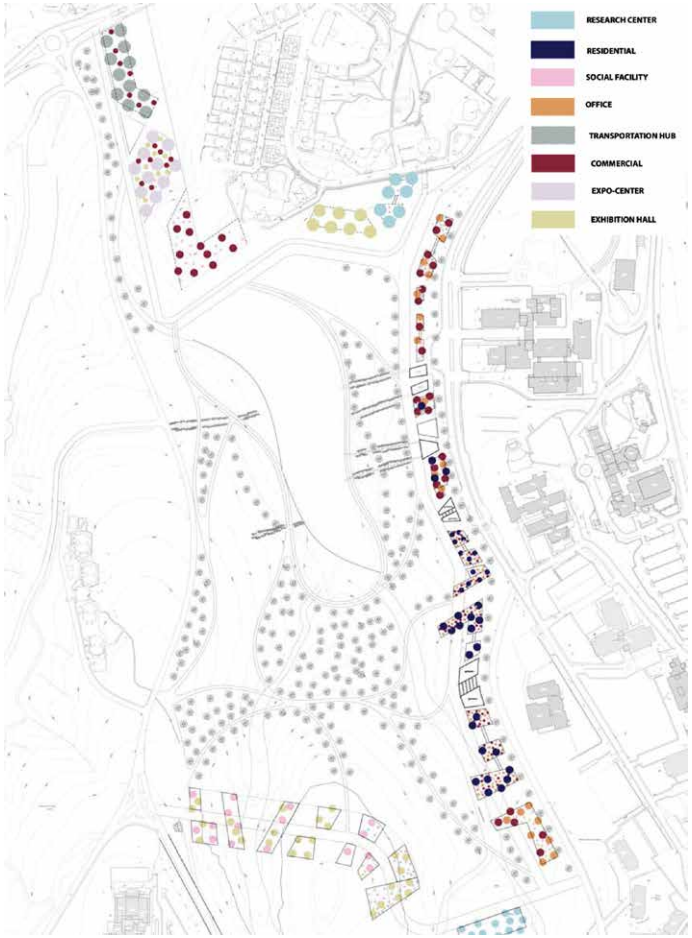
In order to enable thorough and direct access from the Eskişehir road to the site, a monorail line is proposed. The monorail line connects fluently to the Transportation Hub located in the main gate of Bilkent University. The transportation hub proposal is not solely a station, rather it is a space where social activity and movement is encouraged.

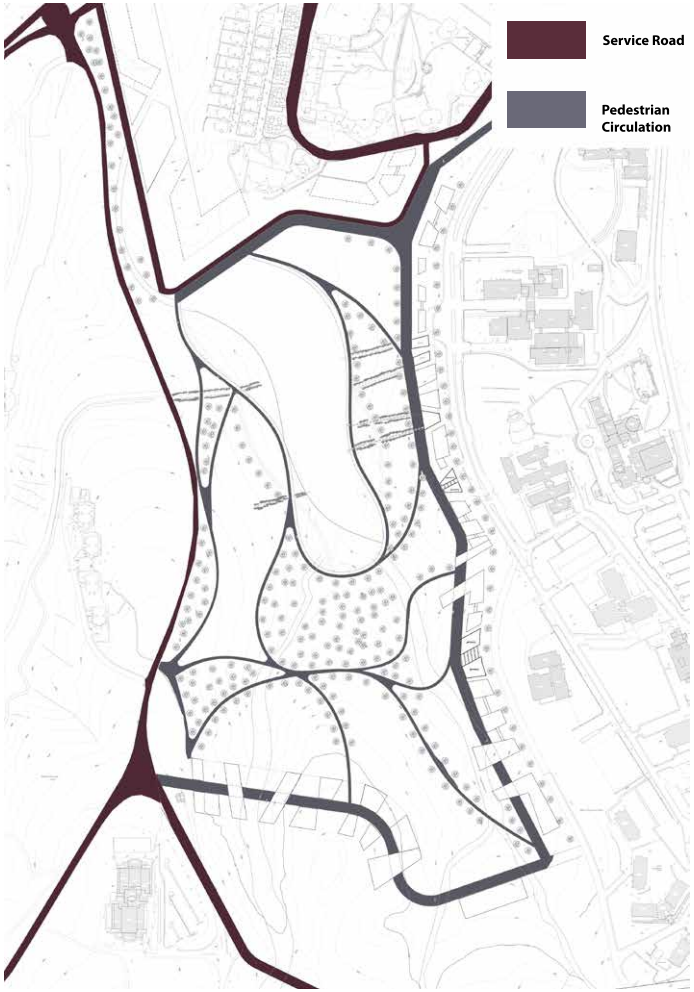
One of the main problems that was identified was the road that leads from the Music Faculty to the East Campus. The road cuts the site in a very unthoughtful and logical manner. Urban corridor without walls proposes the replacement of the road with a series of buildings that act as both a bridge and a double urban front. The creation of the urbanity aims to connect the Music Faculty to the site and create common ground for both main and east campus. Additionally the multifunctional use of the urban gate desires to attract a differential user profile and create a modern and urban type of street life. Taking landscape as one of the greatest contextual references of the site along with the existing lake, the urbanity aims to create fluid movement where the main scientific core of Bilkent University can be reestablished.

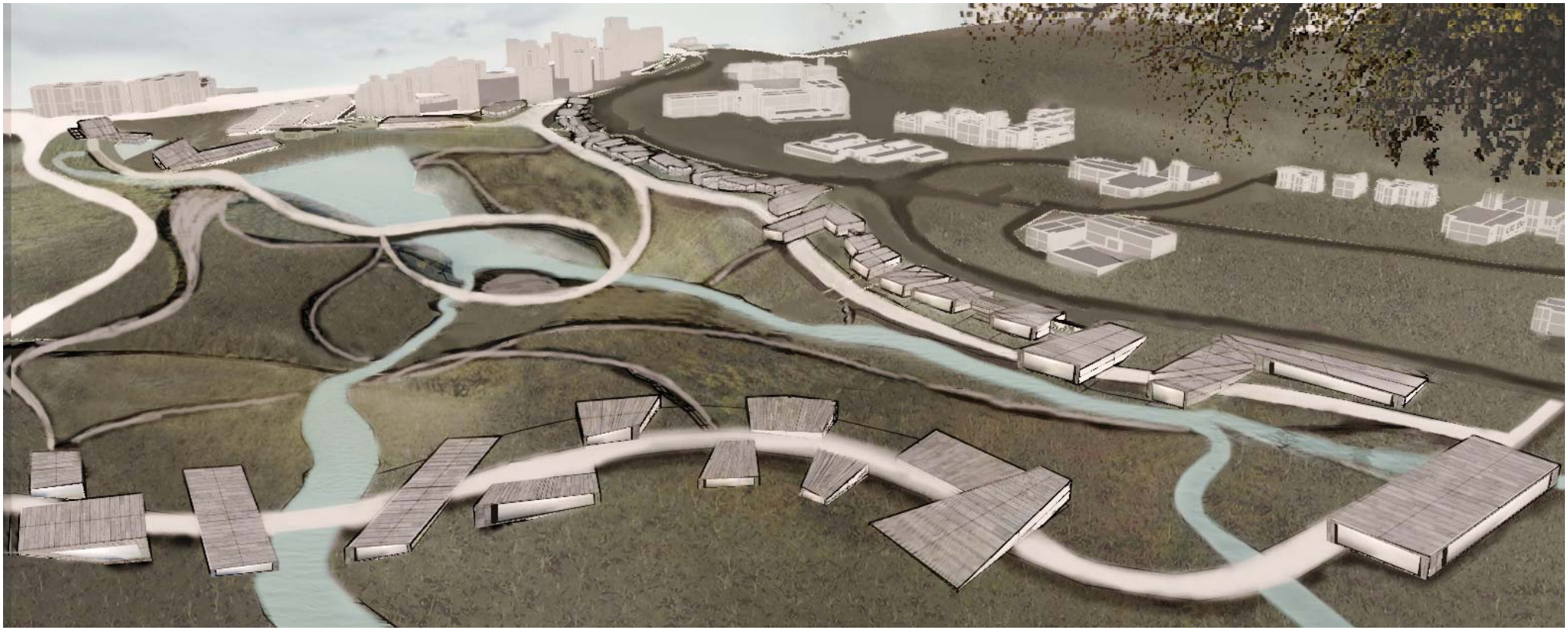



N


GRASS
TREES
BUSHES

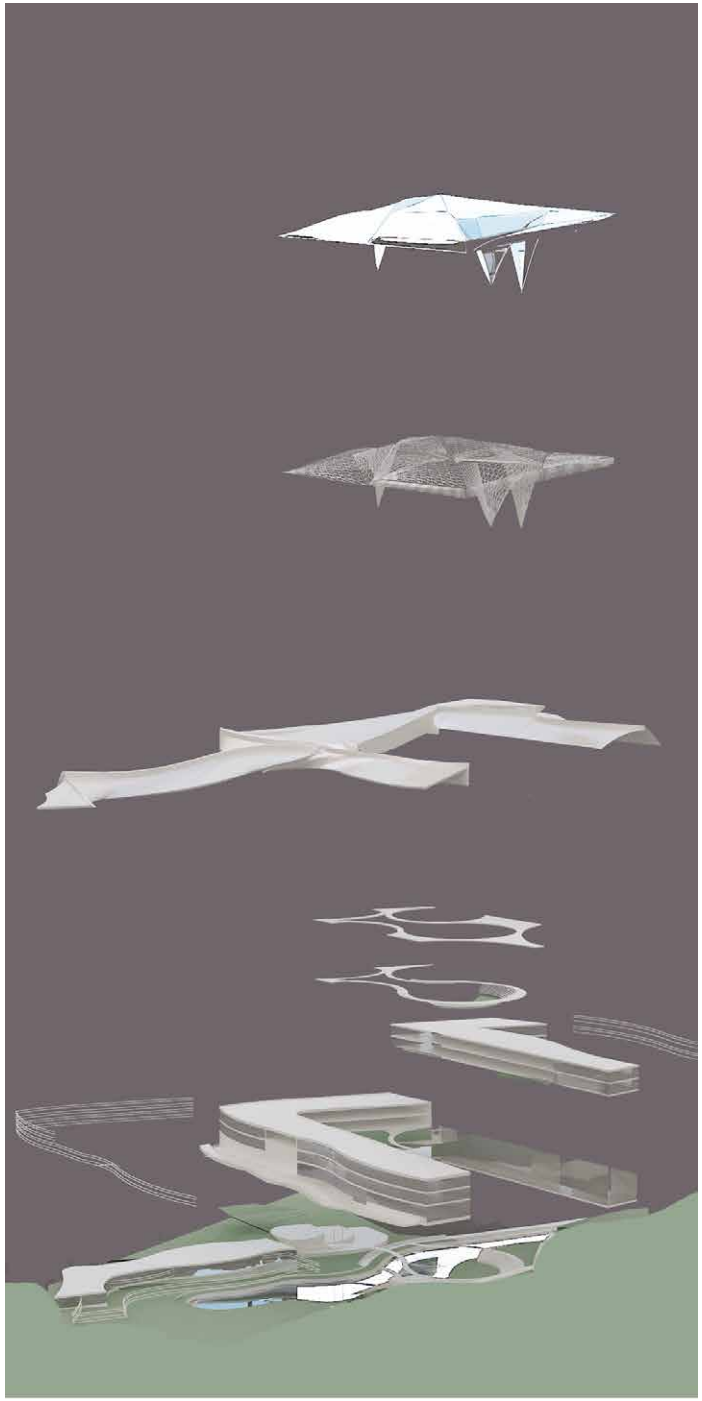

RESEARCH CENTER
RESIDENTIAL
SOCIAL FACILITY
OFFICE
TRANSPORTATION HUB
COMMERCIAL
EXPO-CENTER
EXHIBITION HALL


Service Road
Pedestrian Circulation



F. BETUL GUREŞ

BIODOME



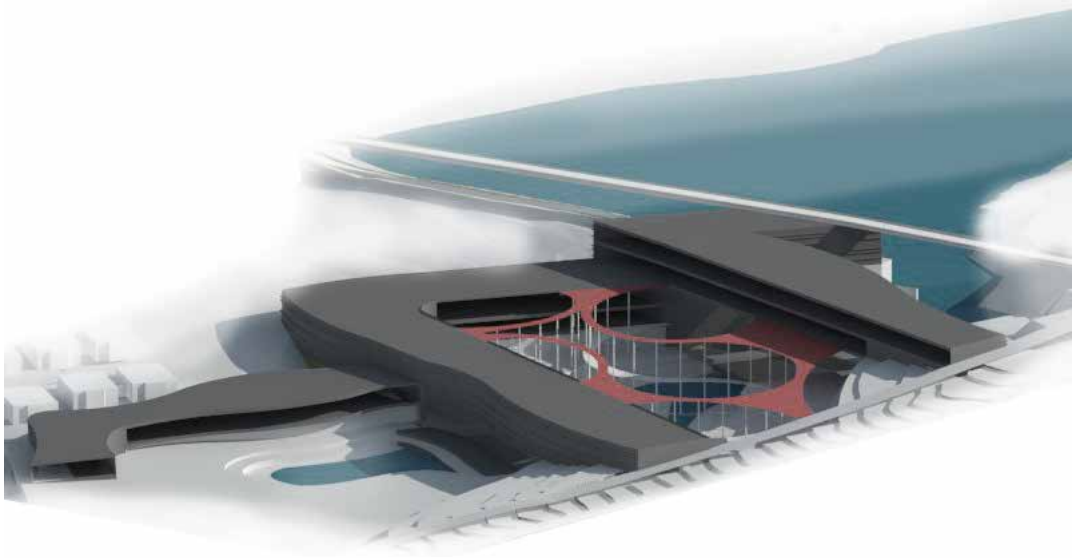
Ankara is a city of Shopping Centers.

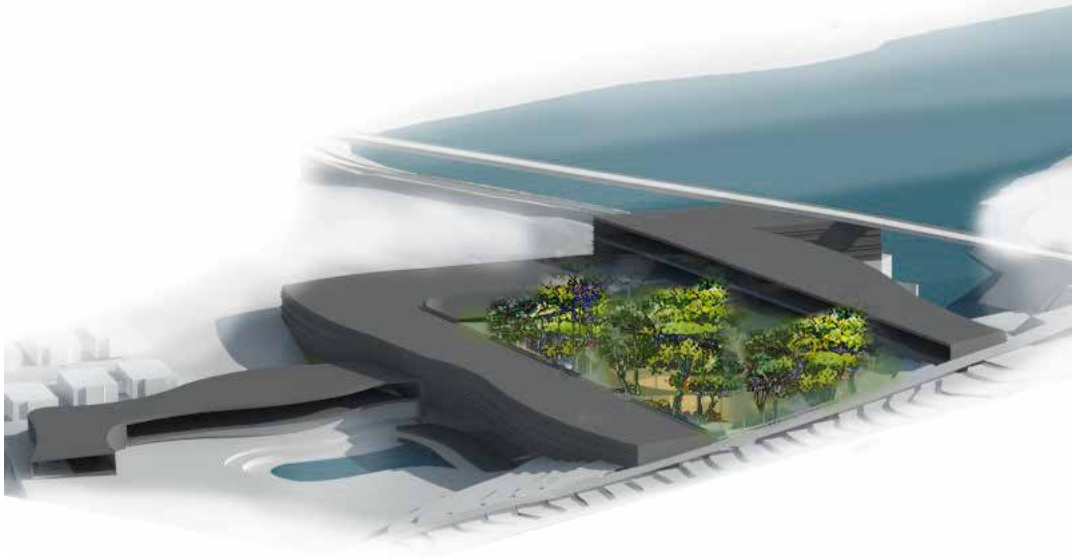
This project's aim was to offer something better for the locals: a bio-dome that would enable the citizens to pass time in nature any time of the year, regardless of the harsh weather conditions of Ankara.

The Re-creation is named after:
Recreation opportunities in the landscape design
Creation of new products
Recreating the pass time acivities of the locals; the shopping Center for a better alternative

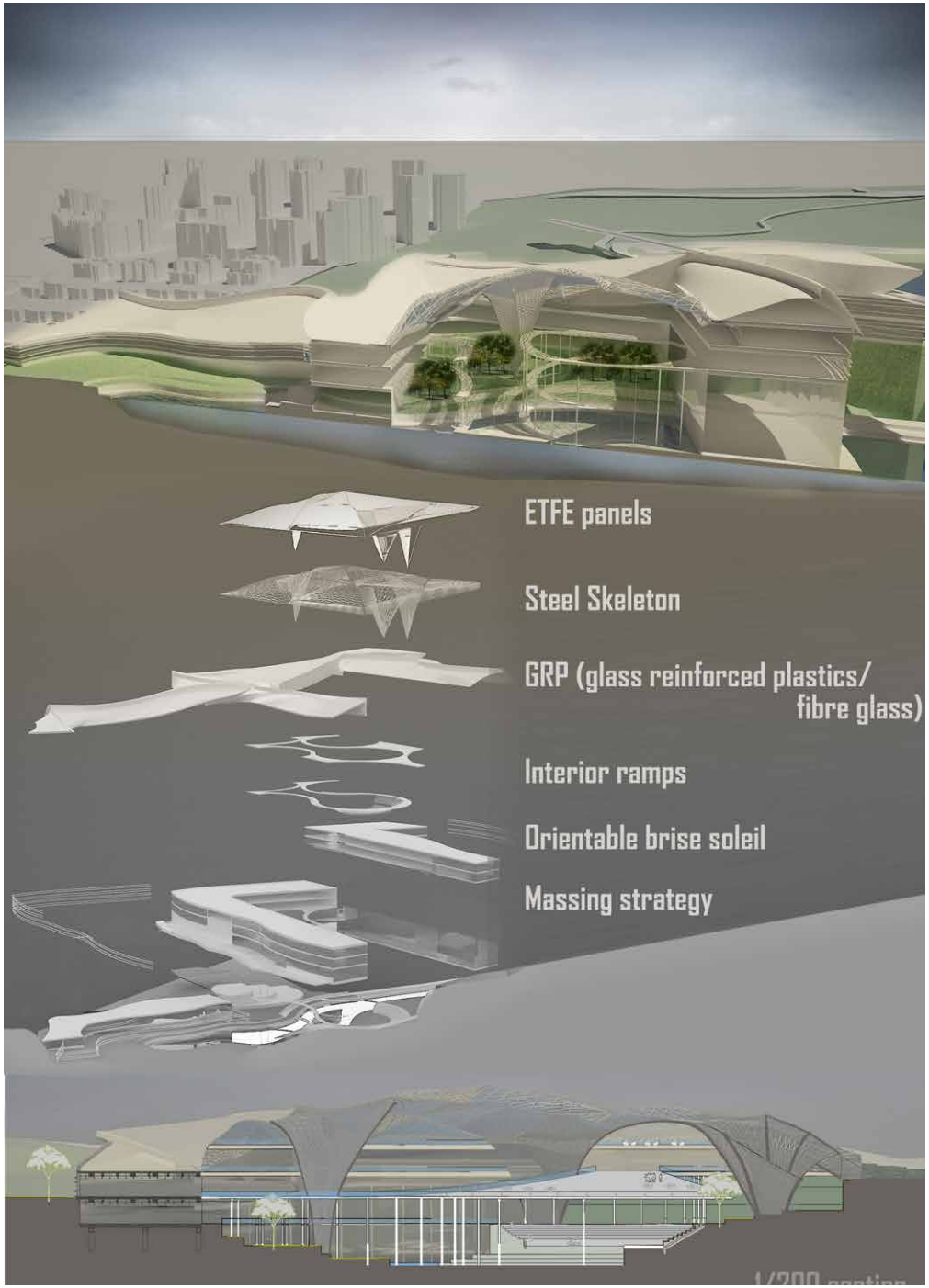
In this purpose, the first thing was designing the lake extension according to the site levels. The water is brought to a lower level through terraces. After this process, I obtained two lakesides. The building is paced on both sides of this lake extension, and provides different circulation possibilities.

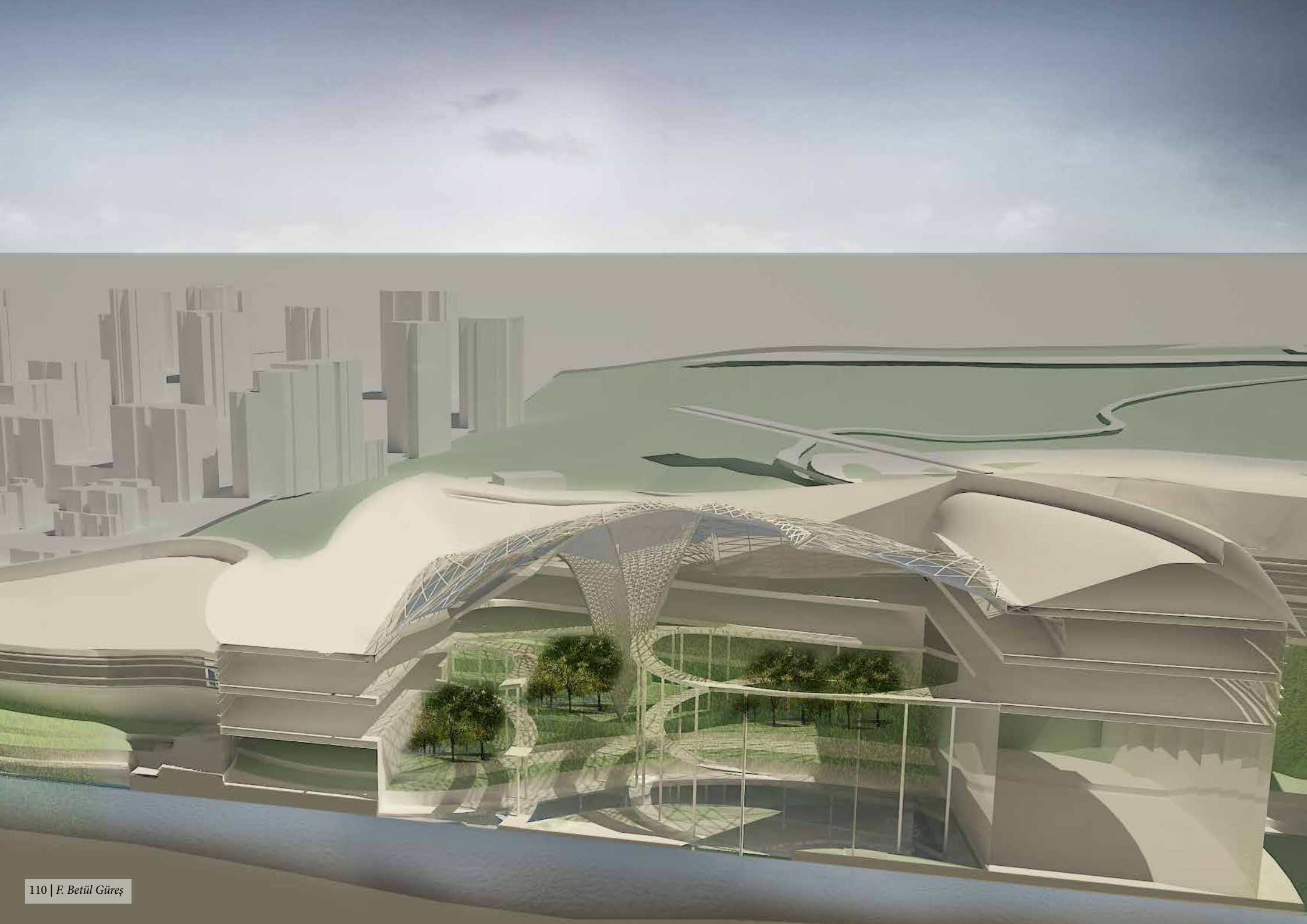
Functionally the project has the same aim of offering something better. Instead of a series of shops, where mass-production products are sold, there are: lecture halls, workshops, exhibition galleries and shops. The purpose of the Re-creation Center is to offer the possibility of producing the goods, insted of just buying them. This is a place where people can: Inspire from nature, Learn by attening lectures, Produce in workshops, Show in exhibitions, Sell and Buy in shops.

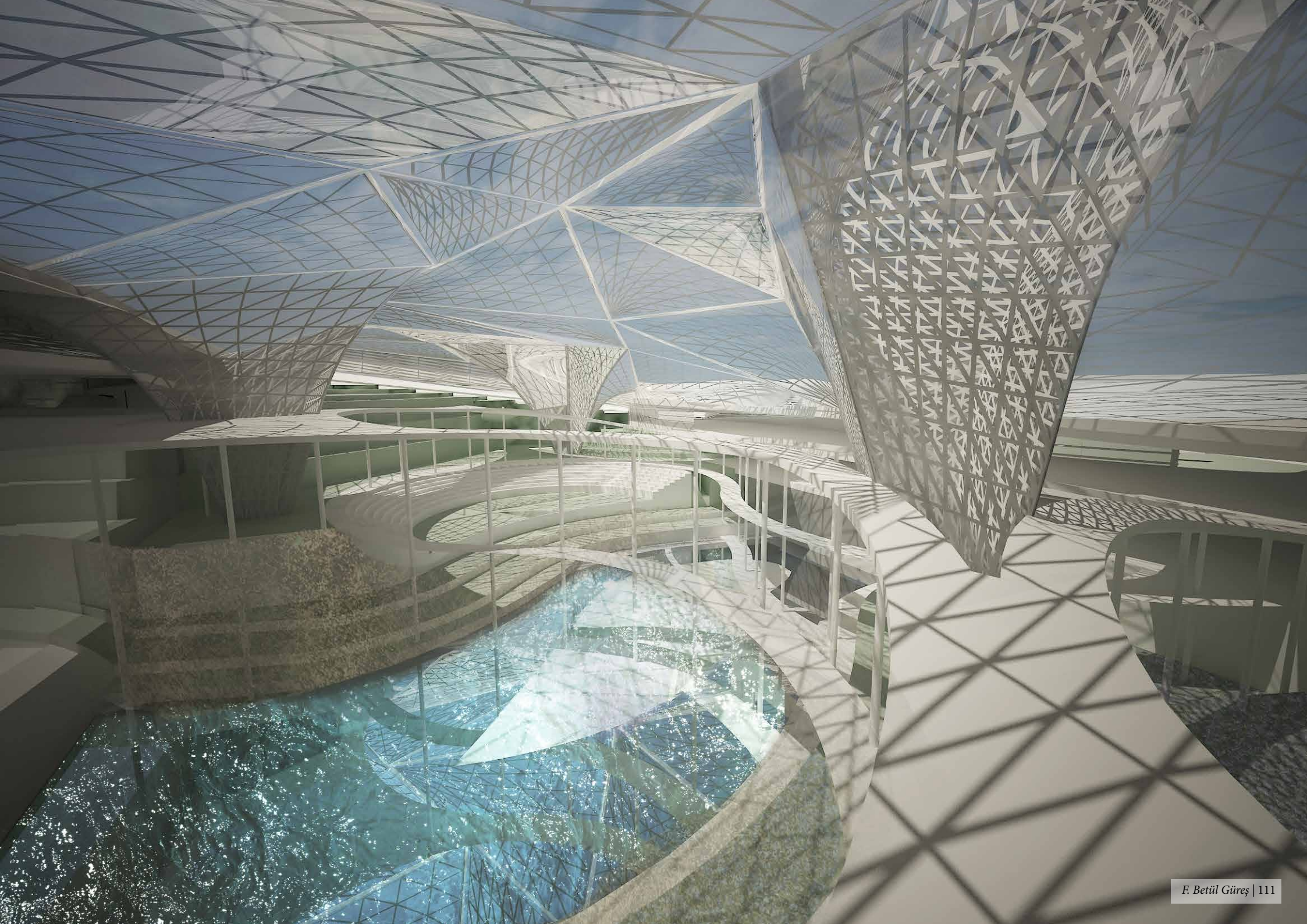





SITE PLAN 1:200

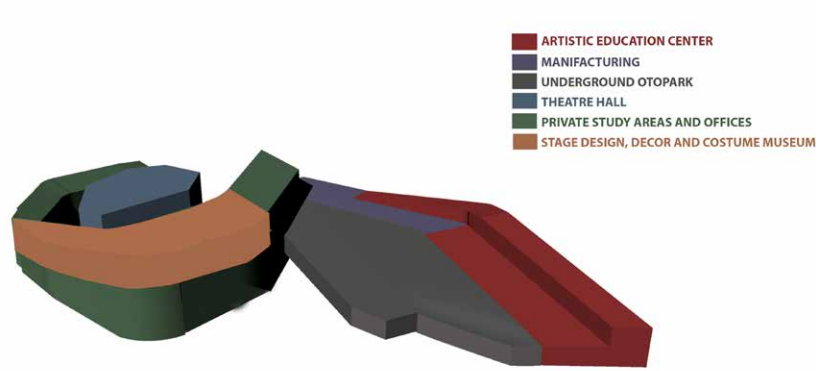

ETFE panels
Steel Skeleton
GRP (glass reinforced plastics/
fibre glass)
Interior ramps
Orientable brise soleil
Massing strategy





ÇISEM BOZBEK

ART CENTER for SOCIETY

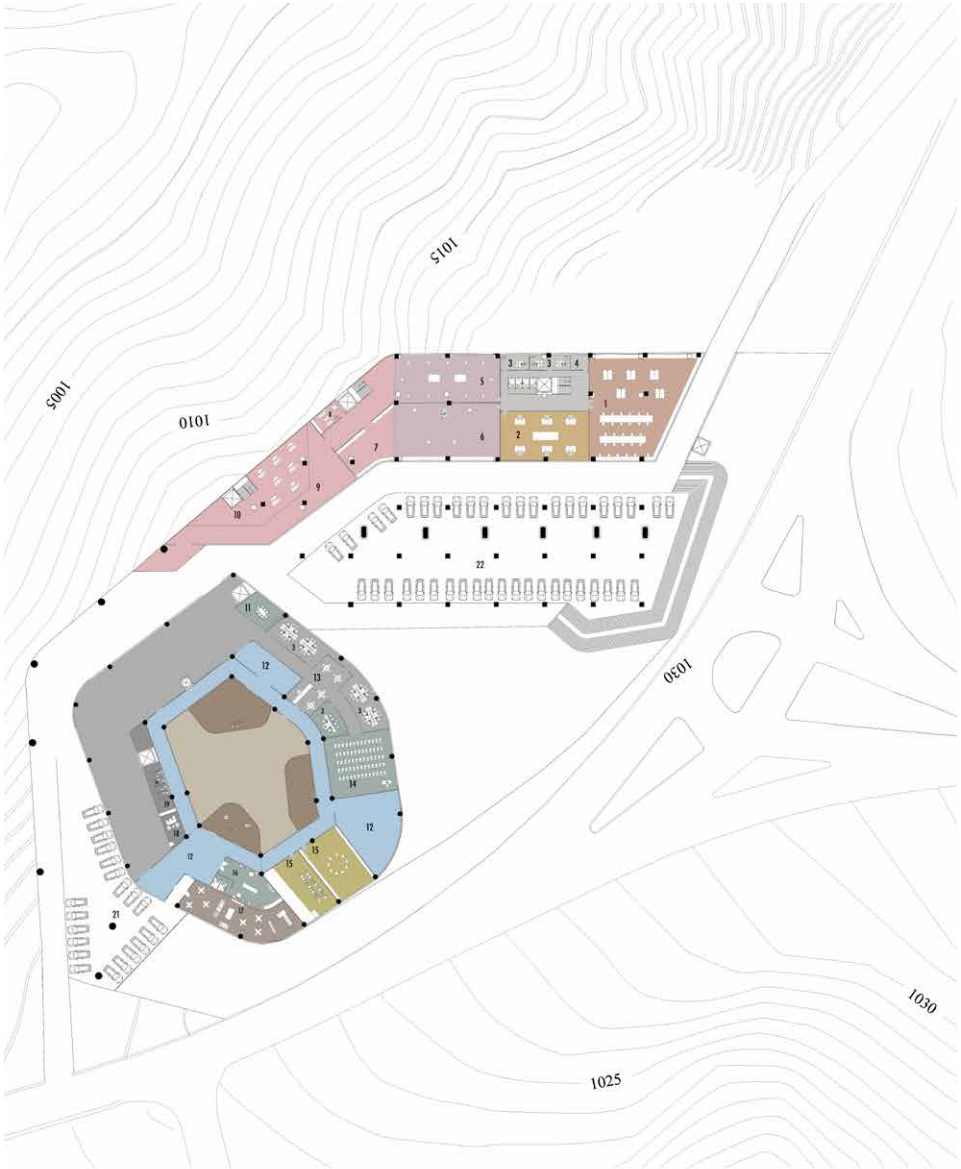


At the beginning of the design process which is deciding to master plan as a group, our idea is located to masses near the boundary of the site and keep the nature surrounding of the lake. In art center project, i follow this idea and located the building complex nearby the road which is between the music and stage arts faculty building and the site in order to make art center serve the music and stage arts faculty building as well. The concept is continuity and the masses are all connected each other with ramps and their roofs so they seem as a whole single mass. The biggest mass which has an organic form includes an experimental theatre hall inside at the center and other functions are solved around this theatre hall. Then, the mass which includes the manufacturing areas connected to this mass with a ramp which becomes the roof of manufacturing mass and surround the theatre mass. Then the mass which is consist of artistic workshop areas connected to manufacturing mass.

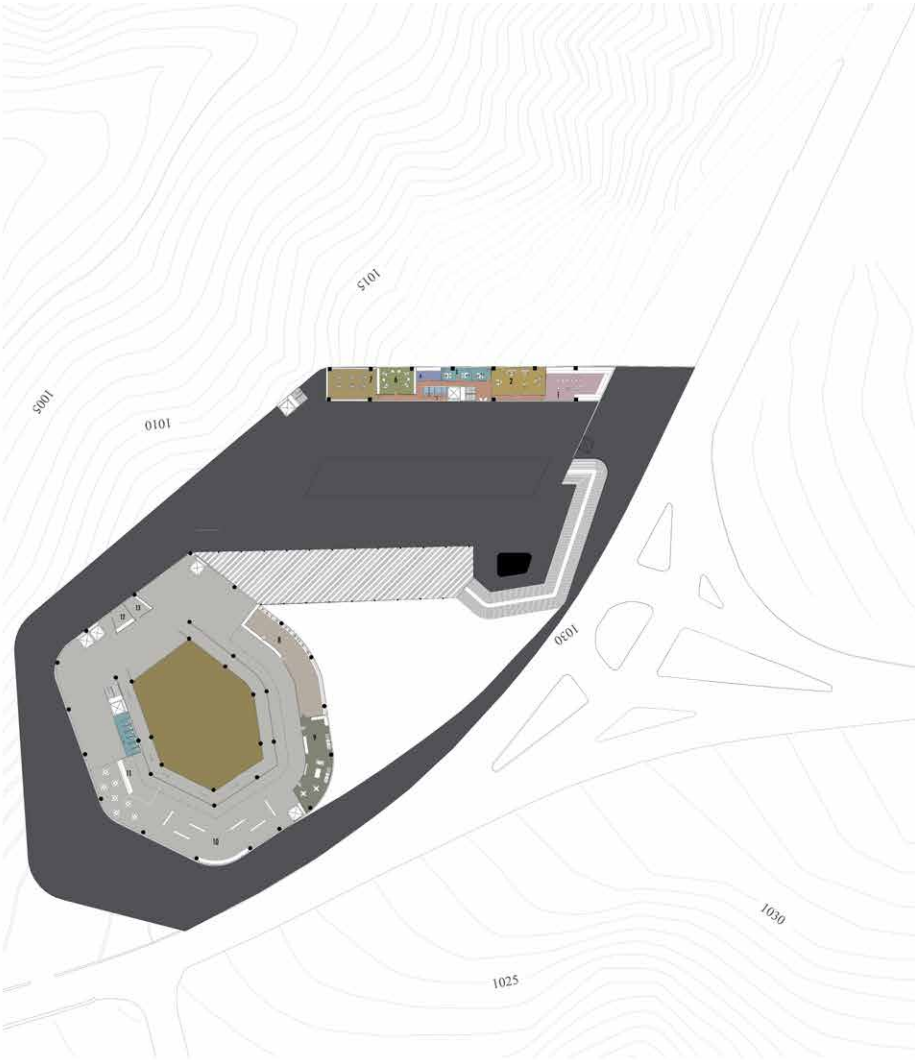
To indicate the concept, continuous knit shaped steel pipes are used as carrying structural elements for transparent surfaces in whole project. Also, welcoming entrance space which is also used exhibition area is covered by a semi-transparent canopy and it is carried by continuous steel pipes with respect to the concept. In addition, continuous curve shaped landscape furnitures are used with respect to the concept.

A part of the underground parking roof is transparent which has a depth so that becoming a landscape pool for up floor and provides natural lighting for underground parking. The carrying system for underground parking allows the trees to grow up in itself, so They become a part of landscape design. The roof of the mass which contains theatre hall is oriented according to the Way of wind. All roofs are continuous and connected each other which are also walk able.

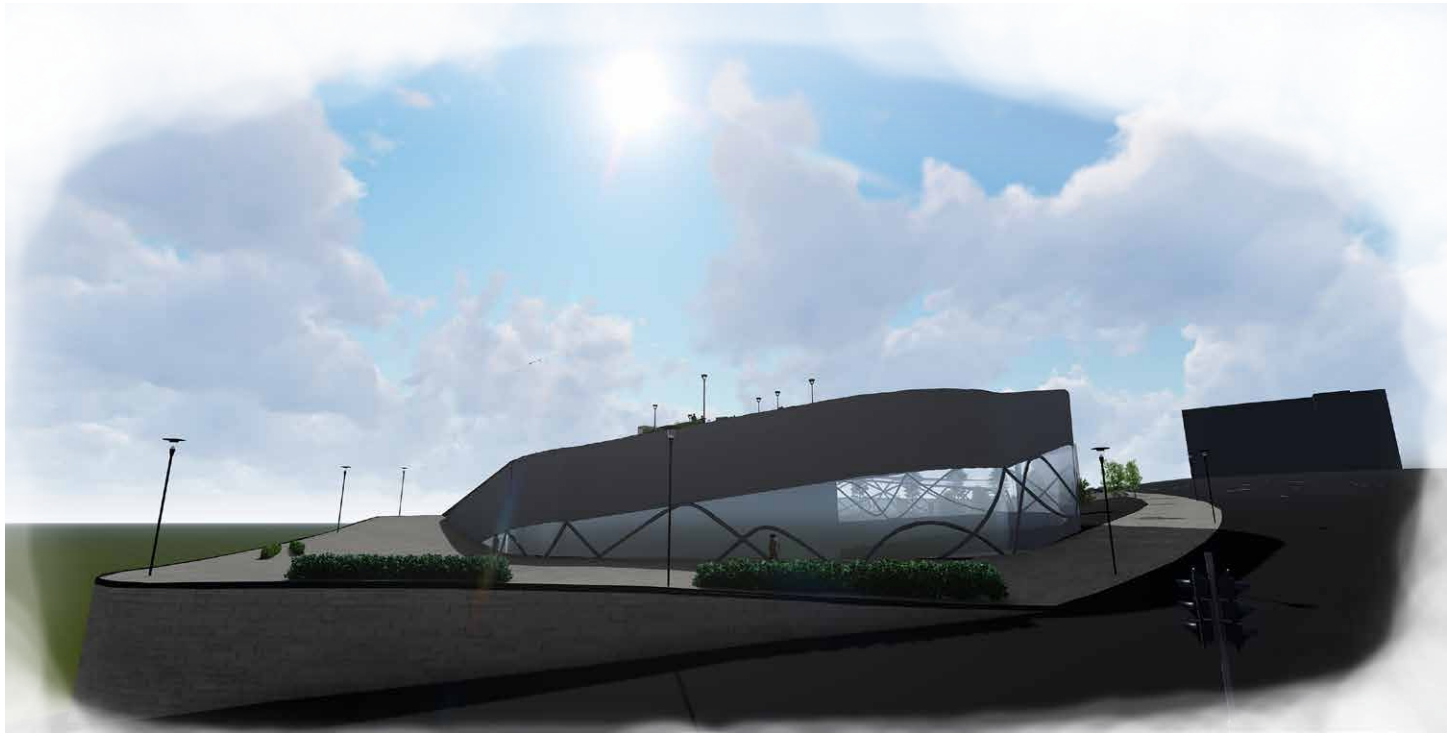
Near the big stairs, an outdoor performing stage is designed so that visitors can sit on the stairs and watch the performances. Moreover, to promote the bicycle usage in the campus, eco-friendly bicycle renting station is designed at the entrance which is near the big stairs.

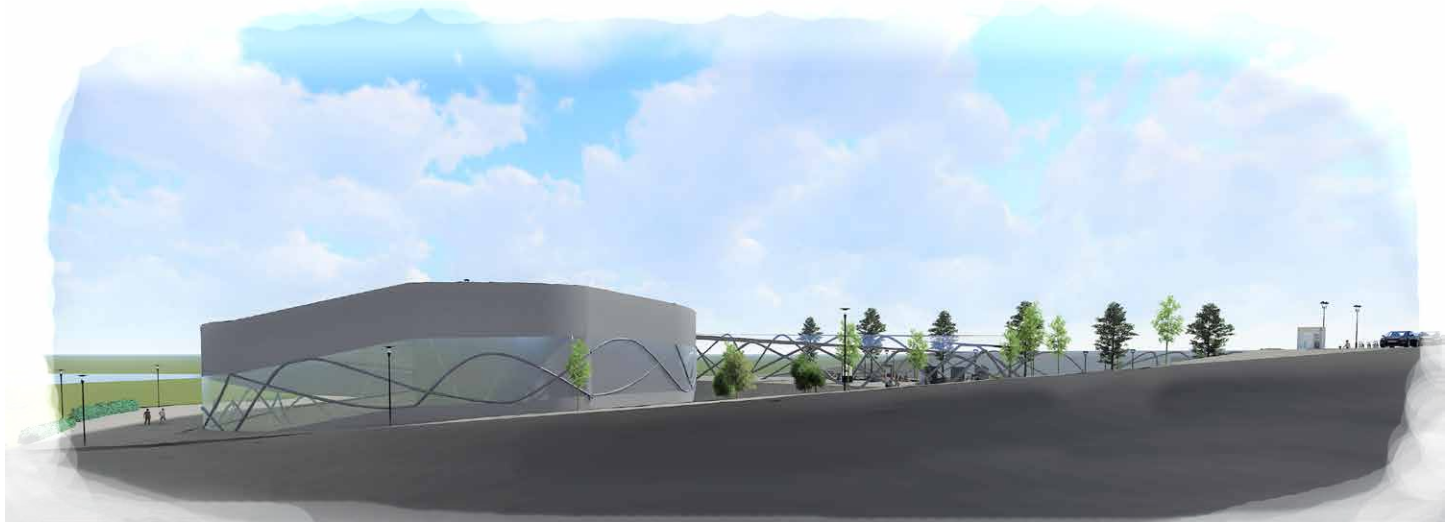


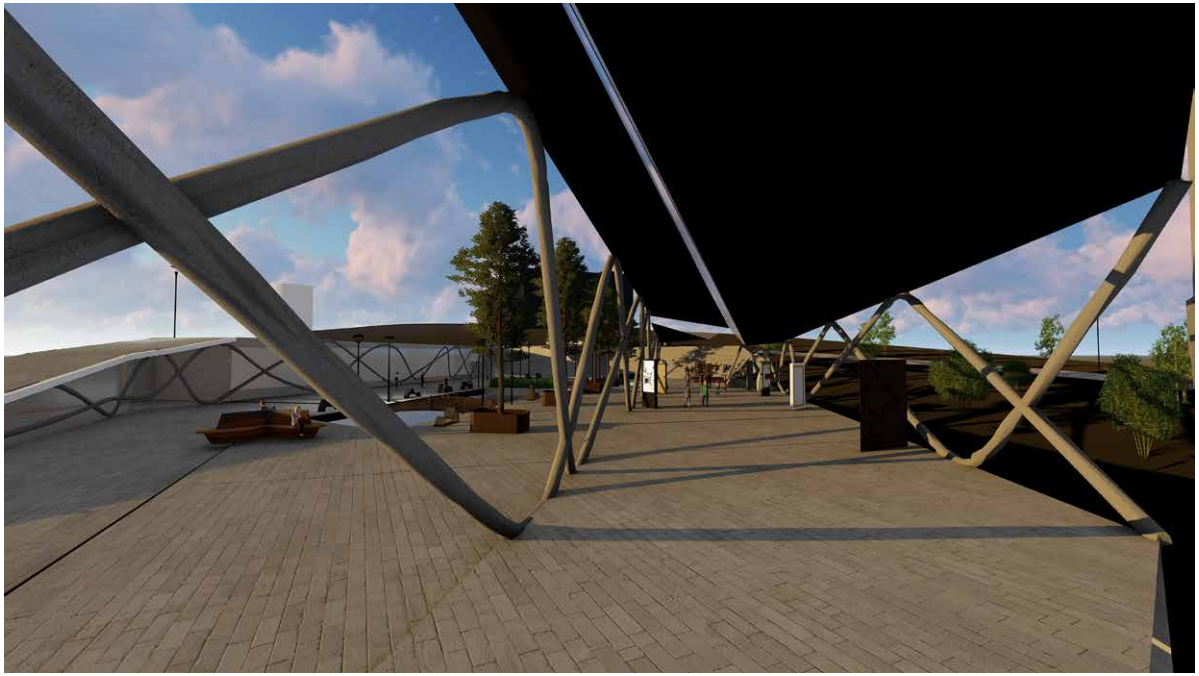
1-CHILDREN LIBRARY
2-CERAMIC WORKSHOP
3-OFFICE
4-SERVICE ROOM
5-PAINTING WORKSHOP
6-SCULPTURE WORKSHOP
7-STORAGE
8-STAFF ROOM
9-DECOR MANUFACTURING
10-COSTUME MANUFACTURING
11-MEETING ROOM
12-BACKSTAGE
13-CAFETERIA
14-CONFERENCE ROOM
15-STUDY ROOM
16-CHANGING ROOM
17- ARTIST RESTING ROOM
18- TECHNICAL ROOM
19-CHANGING ROOM
20-WC
21-STAFF PARKING
22-UNDERGROUND PARKING



1-THEATRE WORKSHOP
2-MUSIC WORKSHOP
3-OFFICE
4-STORAGE
5-WC
6-PHOTOGRAPHY WORKSHOP
7-BALET WORKSHOP
8-CLOAK ROOM
9-STAFF ROOM
10-EXHIBITION HALL
11-CAFE
12- SECURITY OFFICE
13-TICKET OFFICE







G. DILARA DEMIRTAŞ

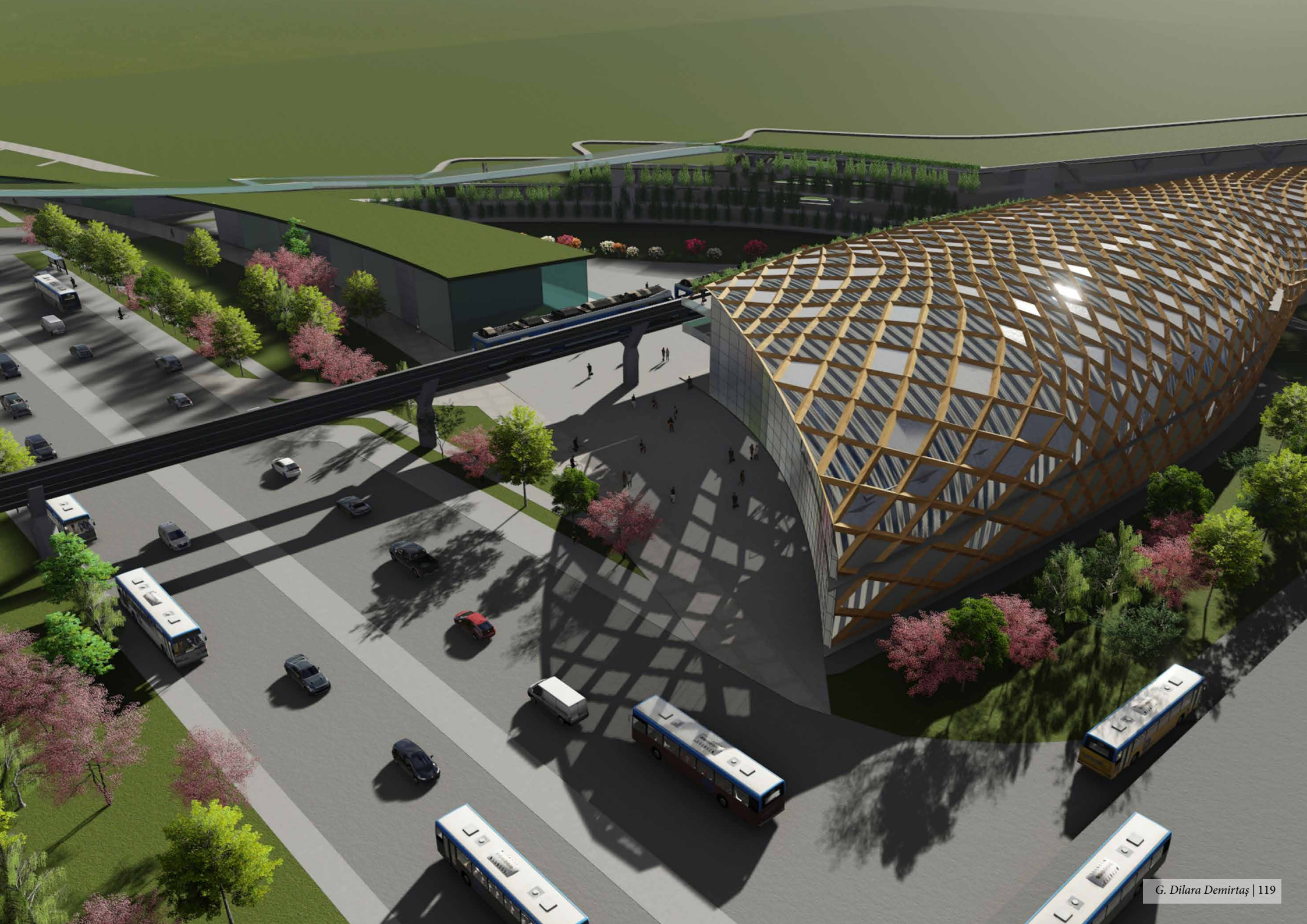
TRANSPORTATION HUB

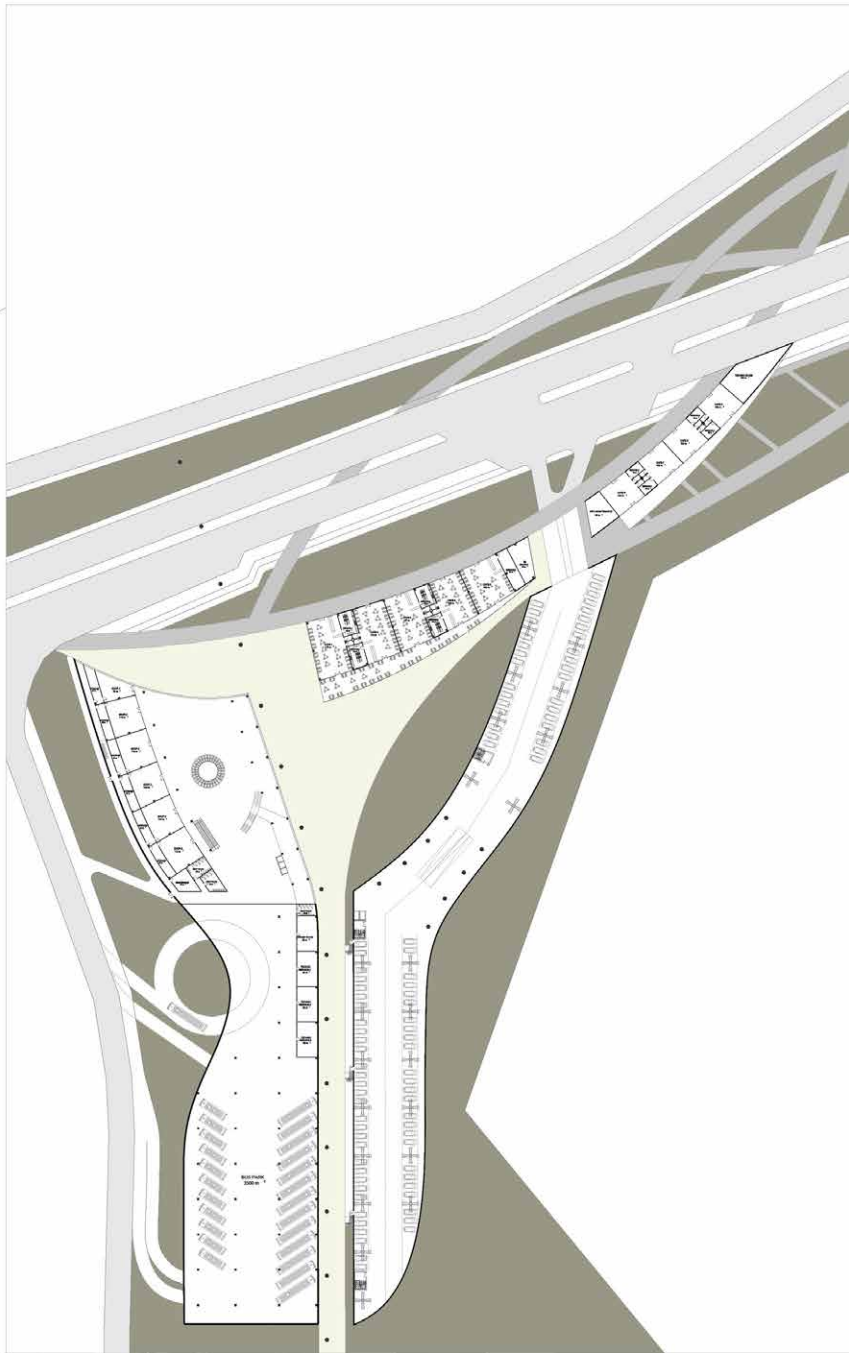
The main aim of that transportation hub is connecting city to our site via monorail. The hub will create an entrance to lake and site. In the 1/5000 master plan, the axis of Monorail can be seen. The monorail station begin from the Bilkent metro station and it continue throughout the Beytepe Road and it has additional stations where are; City Hospitals, METU Teknopark, Military Rehabilitation Center and Bilkent Plazas that includes TOKI , BOTAŞ, RTUK. The monorail road will continue to inside of site. The hub includes 3 different transportation systems; the Monorail system, Car Parking and Bus Parking.

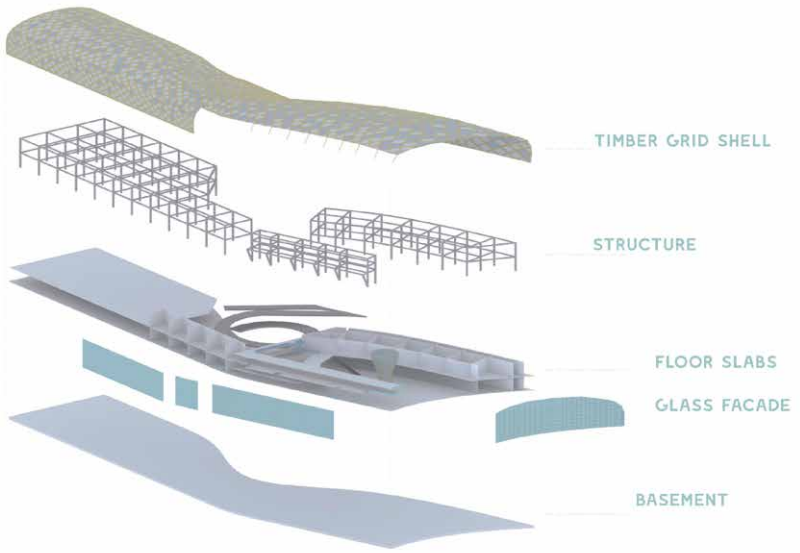
Mass Allocation; for mass allocation the current axis formed the masses. IVlain pedestrian axis from bus station to Bilkent (Real) Station is one of them. The axis that uses by buses is another axis. And the site now used as a bus parking so the Transportation hub should provide a space for buses. Because of the main pedestrian axis throughout the road, the commercial facilities will be located along the road. The gaps between the commercial facilities create a welcoming space to site and the plaza form a meeting place to people came from both monorail and their own car.

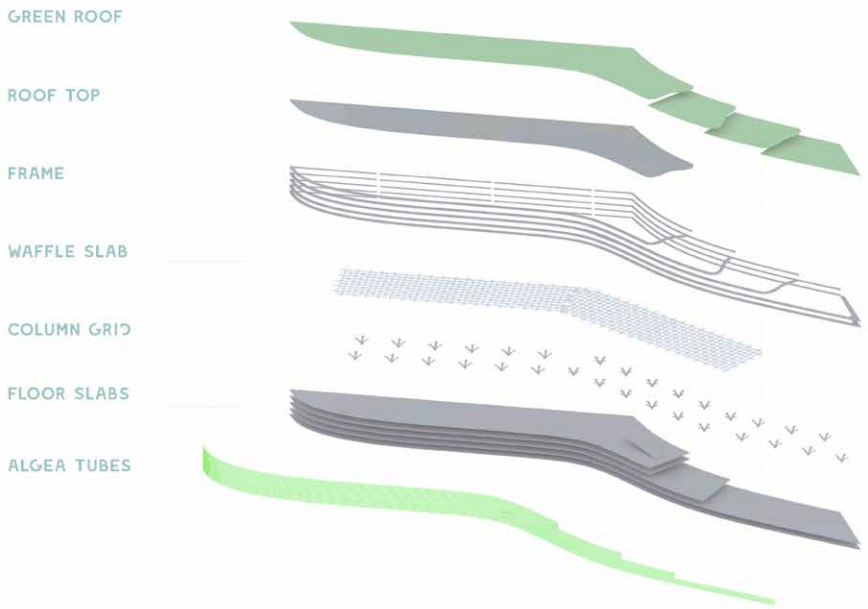
Functions; although the main aim of the structure is a Transportation Hub, the social and commercial spaces are essential to attract to people to site. There is flow public to private for the design of structure both horizontally and vertically. One of the structures is a car parking space but it is not a traditional car parking space, it can be multifunctional space for the different purposes like workshops or exhibitions. The other structure is a kind of mix used one. It includes bus parking, monorail station, commercial and social spaces. The structures have connections via the bridge.

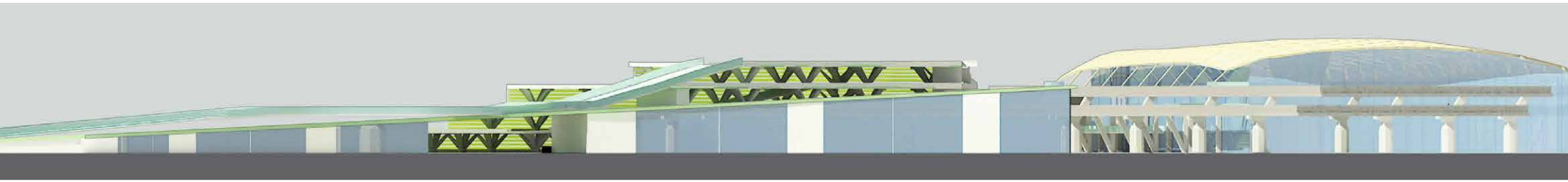
For the sustainable approach; The Algae Energy Production facade system will be used for south facades. The waste water and Co2 are converted to biomass and also Electricity with the help of algae panels. It also helps to control heat gain in summer time. For North facade the buffer zone will reduce energy loss. For the roofs green roofs are covered the top of structures. Semi open space roofs are covered with ETFE system which changed according to sun light. And also some gridshell structure panels also covered with PV panels according to sun direction.

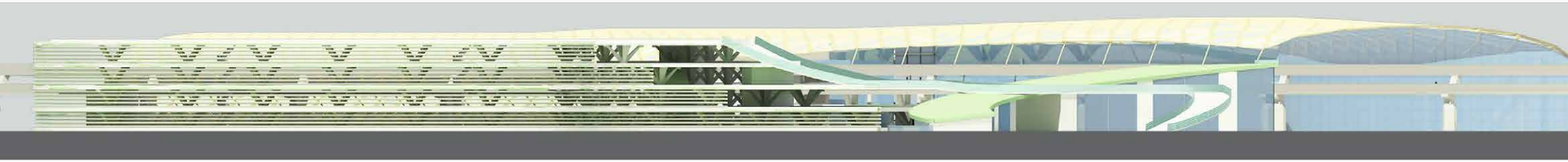


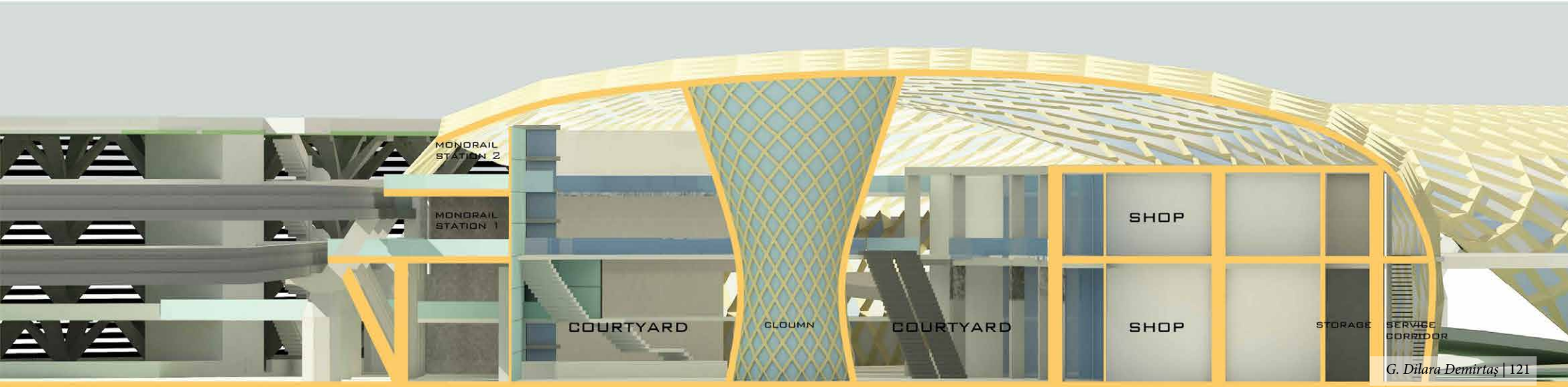



TIMBER GRID SHELL
STRUCTURE
FLOOR SLABS
GLASS FACADE
BASEMENT


GREEN ROOF
ROOF TOP
FRAME
WAFFLE SLAB
COLUMN GRID
FLOOR SLABS
ALGEA TUBES

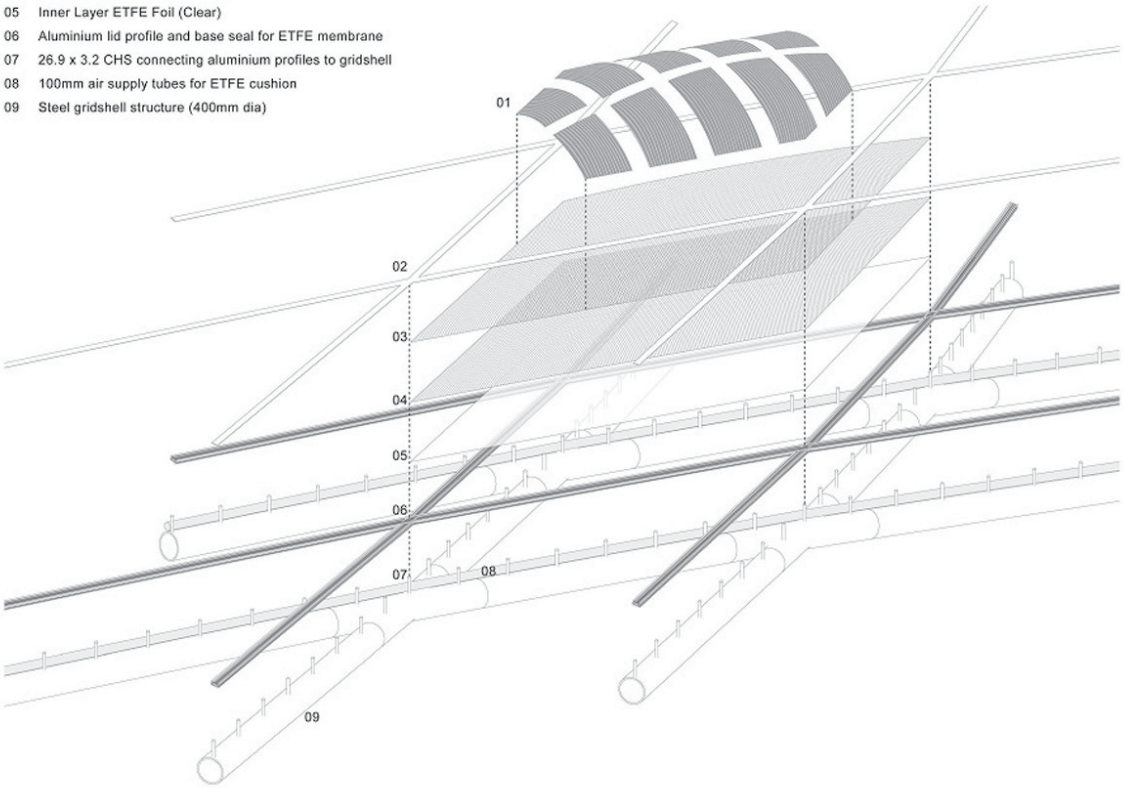


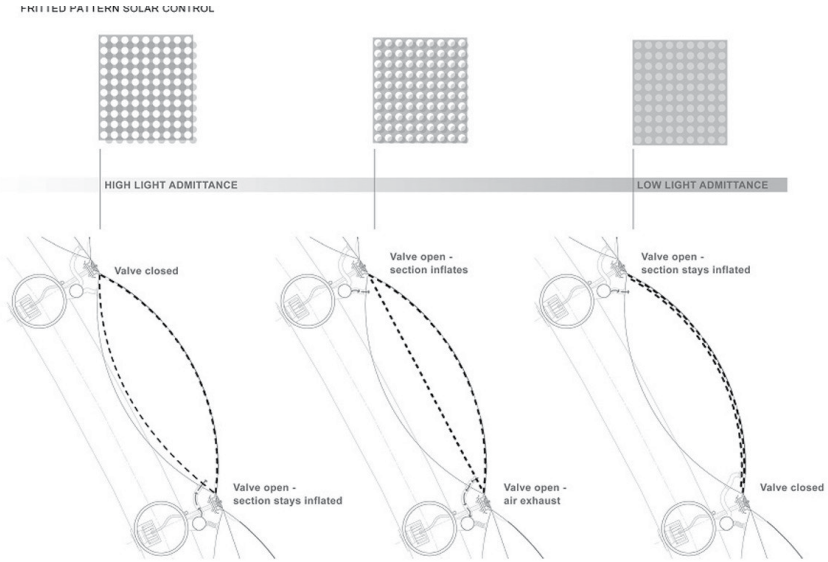



MONORAIL
STATION 2
MONORAIL
STATION 1
COURTYARD
GLOUMN
COURTYARD
SHOP
SHOP
STORAGE
SERVICE
CORRIDOR

Building Skin

01 Amorphous silicon thin-film PV cells
02 Aluminium profile cap seal for ETFE membrane
03 Outer Layer ETFE Foil (Fritted)
04 Middle Layer ETFE Foil (Fritted)
05 Inner Layer ETFE Foil (Clear)
06 Aluminium lid profile and base seal for ETFE membrane
07 26.9 x 3.2 CHS connecting aluminium profiles to gridshell
08 100mm air supply tubes for ETFE cushion
09 Steel gridshell structure (400mm dia)



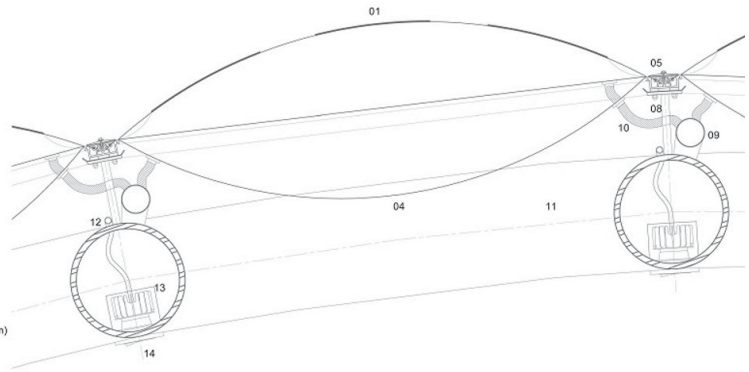


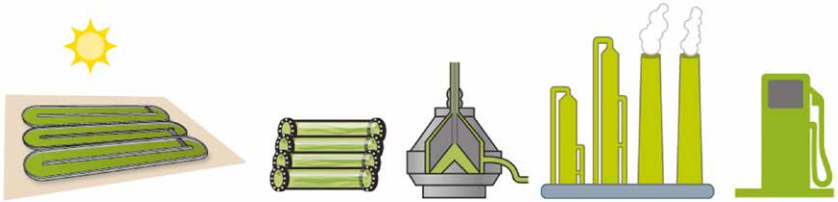
LOW

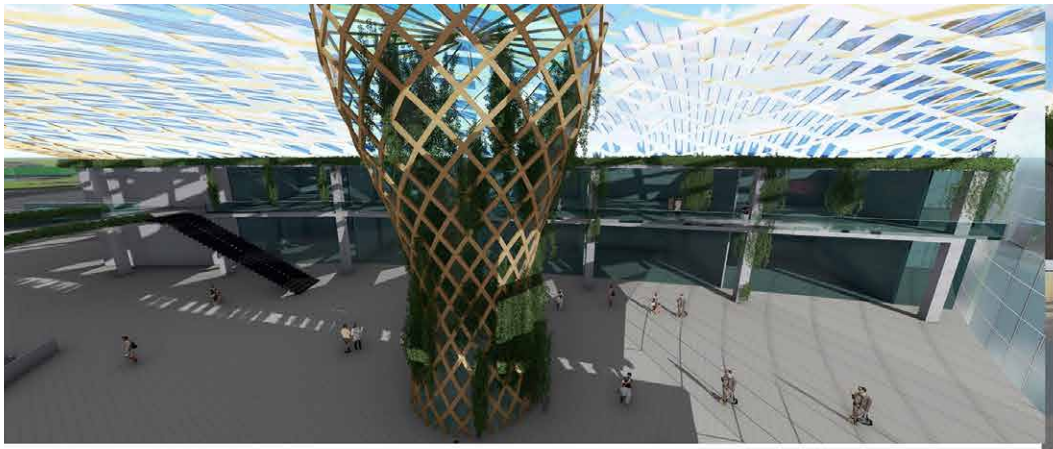
rphous silicon thin-film PV cells
r Layer ETFE Foil (Fritted) - surface of the foil is covered with a variety of patterns
duce solar gain while retaining translucency
lle Layer ETFE Foil (Fritted)
r Layer ETFE Foil (Clear)

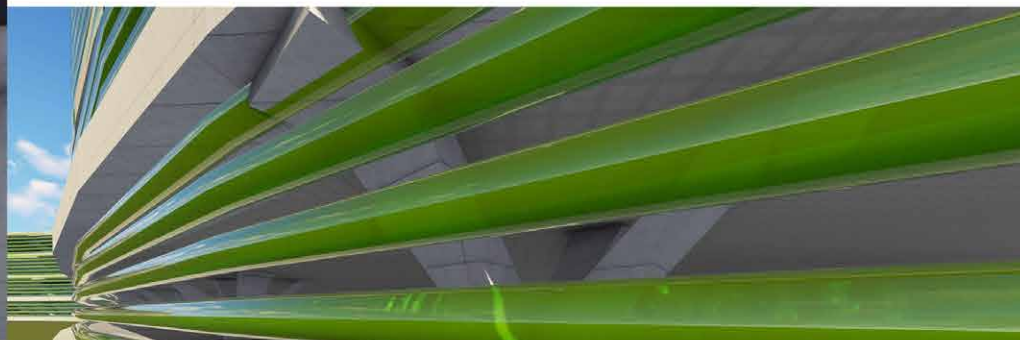
inium profile cap seal for ETFE membrane
inium lid profile and base seal for ETFE membrane with condensation gutter
x 10 steel flat section
x 3.2 CHS connecting aluminium profile to gridshell

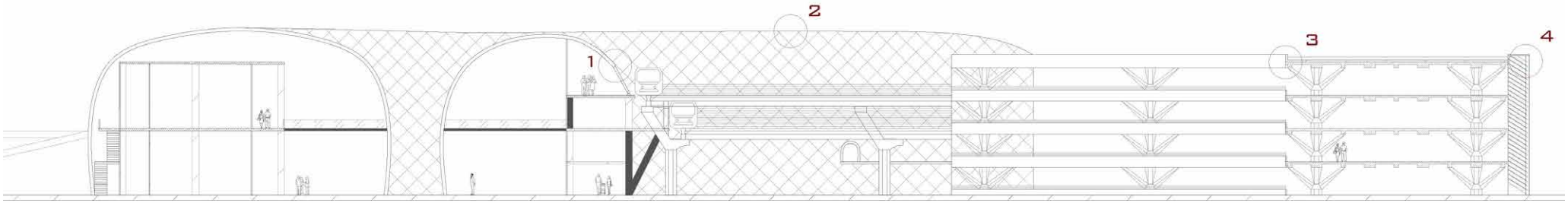
nm air supply tubes for ETFE cushion
m dia Flexible air supply tubes connected to respective ETFE layer
gridshell roof member (400mm dia 20mm thick) with white intumescent paint finish
trical wiring
essed light enclosure bolted to node connection (see Gridshell Node Connection diagram)
icent CLF7011 950 lumen 15W LED recessed adjustable downlight







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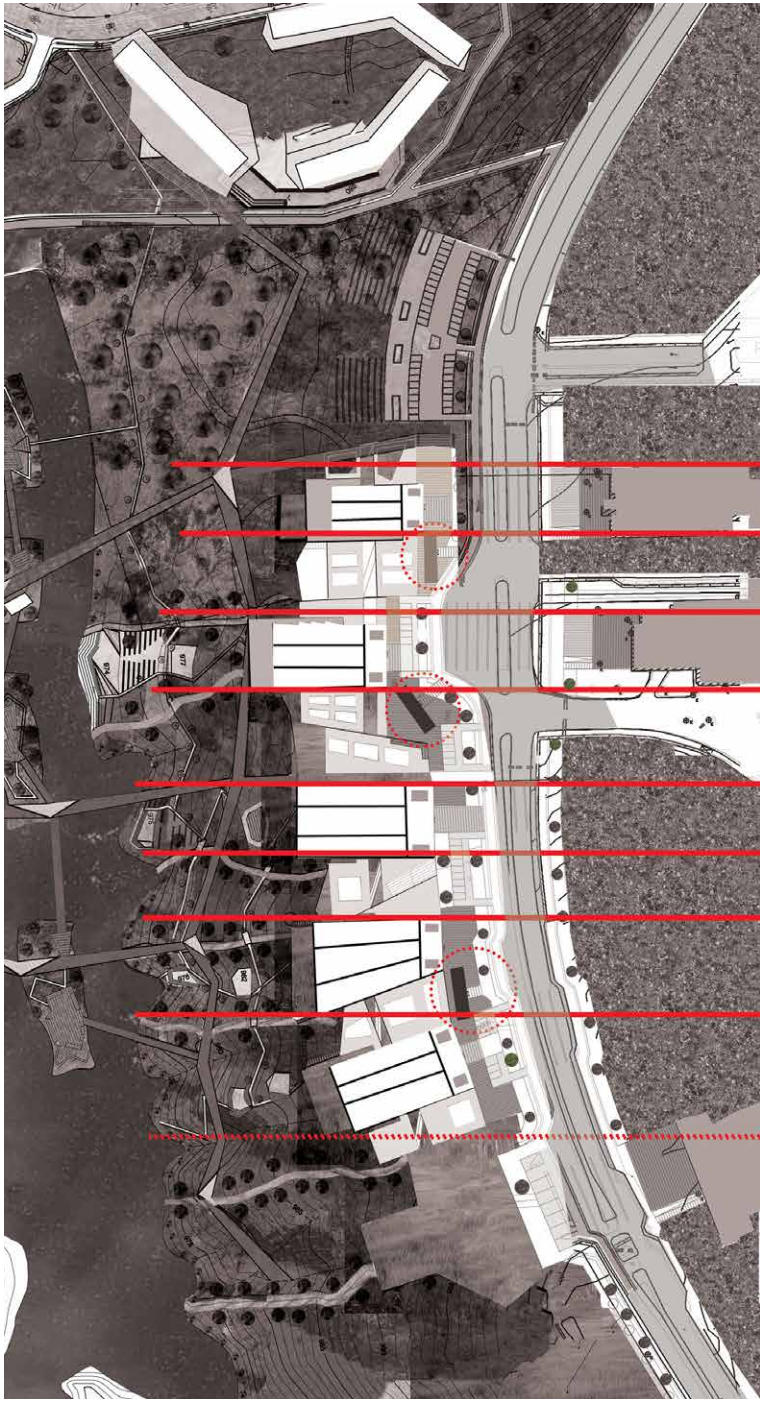
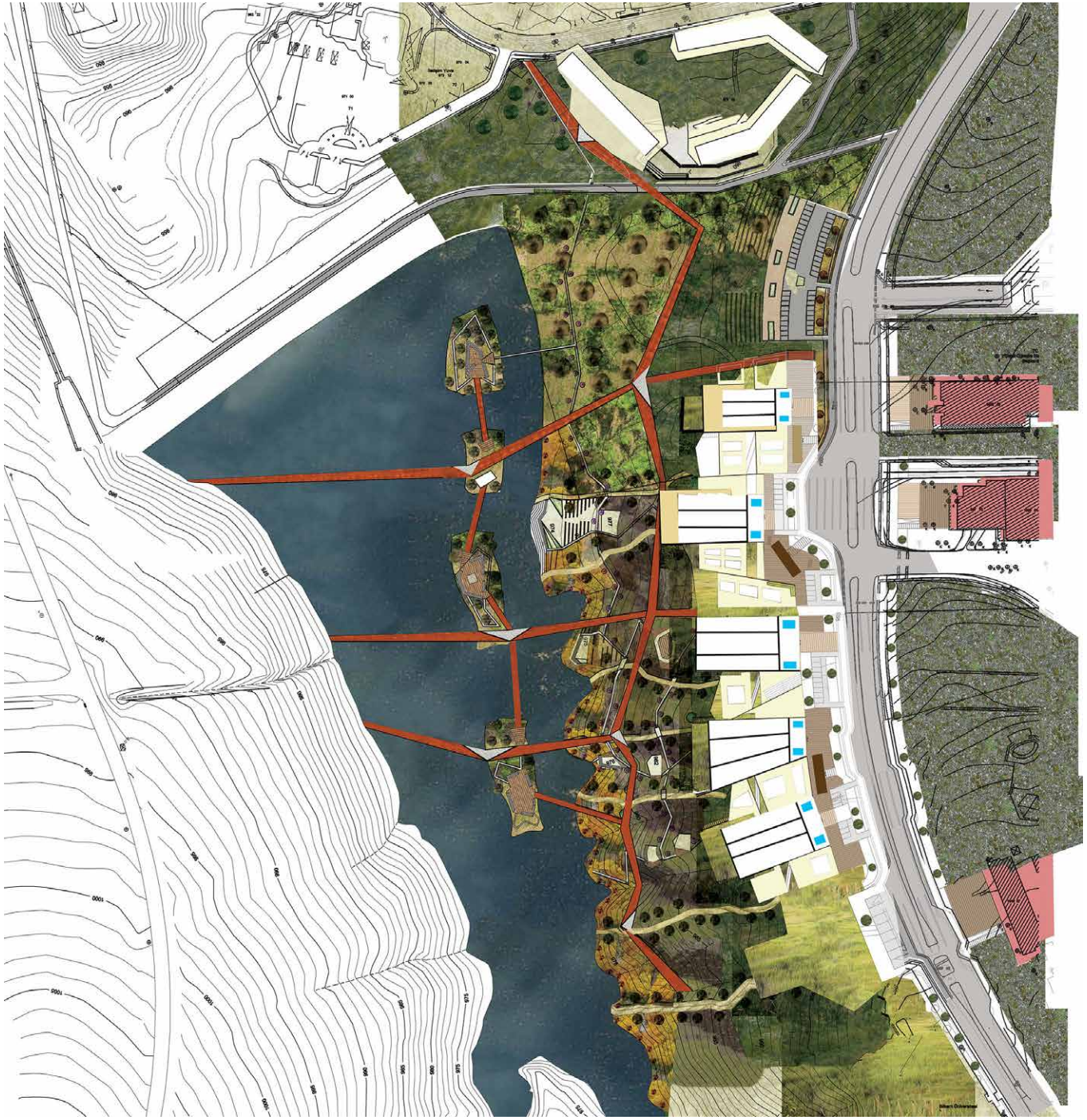
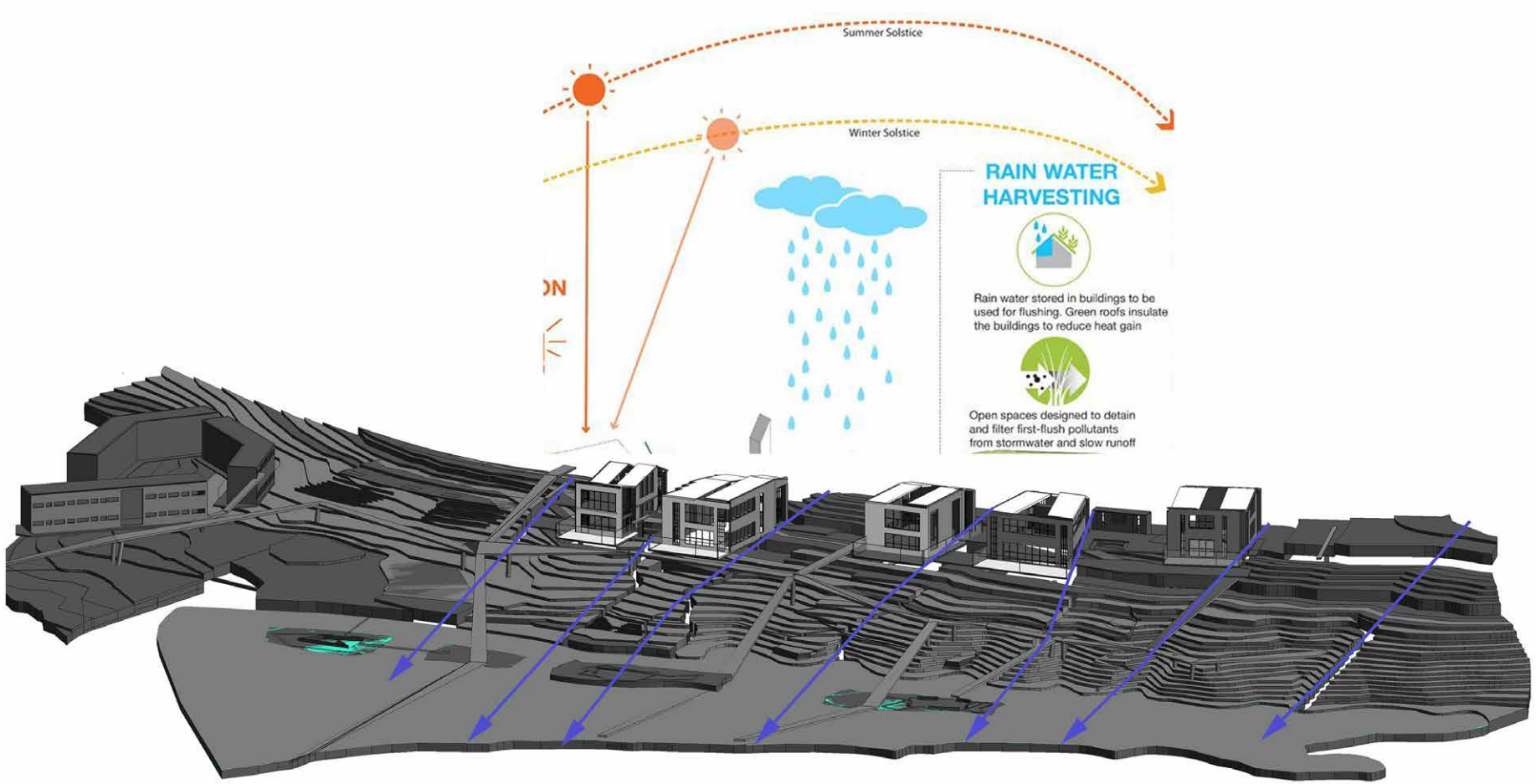
MELIS ERDEM

THE NEIGHBORHOOD

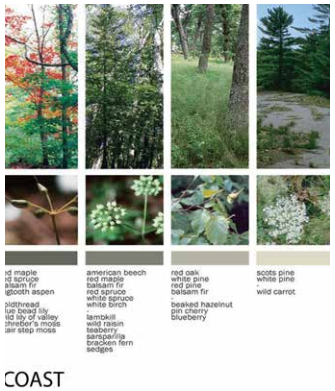
With the effort focusion on creating an urban street to open up to the outside and at the same time merging the outsite with inside, in this project with effort placed on creating different functions needed to be in a street envrionment. Buildings are placed so as to give as little as damage possible and be ecologically friendly by elevating them from the floor and creating areas for different functions as well. The functions the project includes are followings: exhibition hall, library, sport center, chamber theatre and workshops. And small shops are also placed so as to creating different functions.



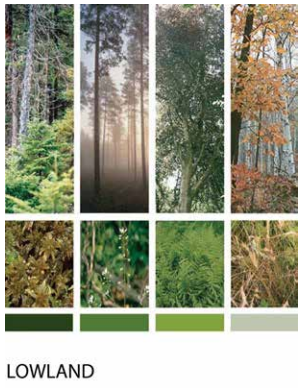



Summer Solstice
Winter Solstice
RAIN WATER HARVESTING
Rain water stored in buildings to be used for flushing. Green roofs insulate the buildings to reduce heat gain
Open spaces designed to detain and filter first-flush pollutants from stormwater and slow runoff


salt marsh
cord grass
eel grass
marsh hay
wild radish
meadow rue
witherod

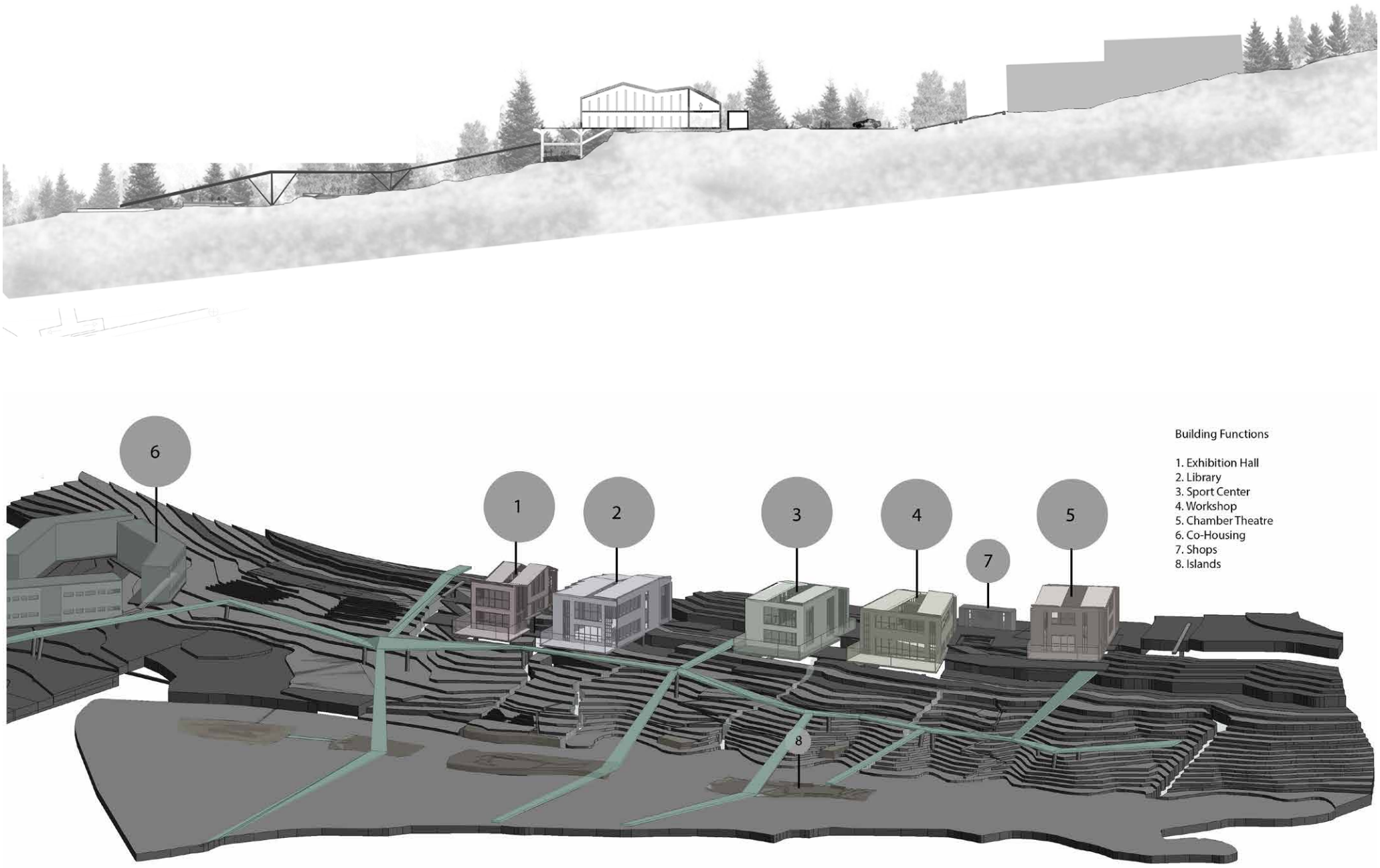

COAST


LOWLAND


LOWLAND


UPLAND


UPLAND


6
1
2
3
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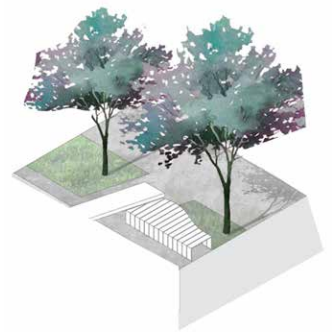
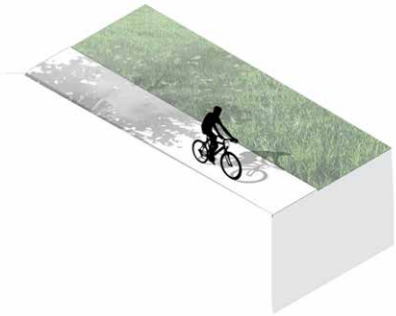
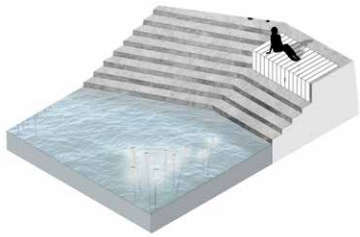
8
Building Functions
1. Exhibition Hall
2. Library
3. Sport Center
4. Workshop
5. Chamber Theatre
6. Co-Housing
7. Shops
8. Islands

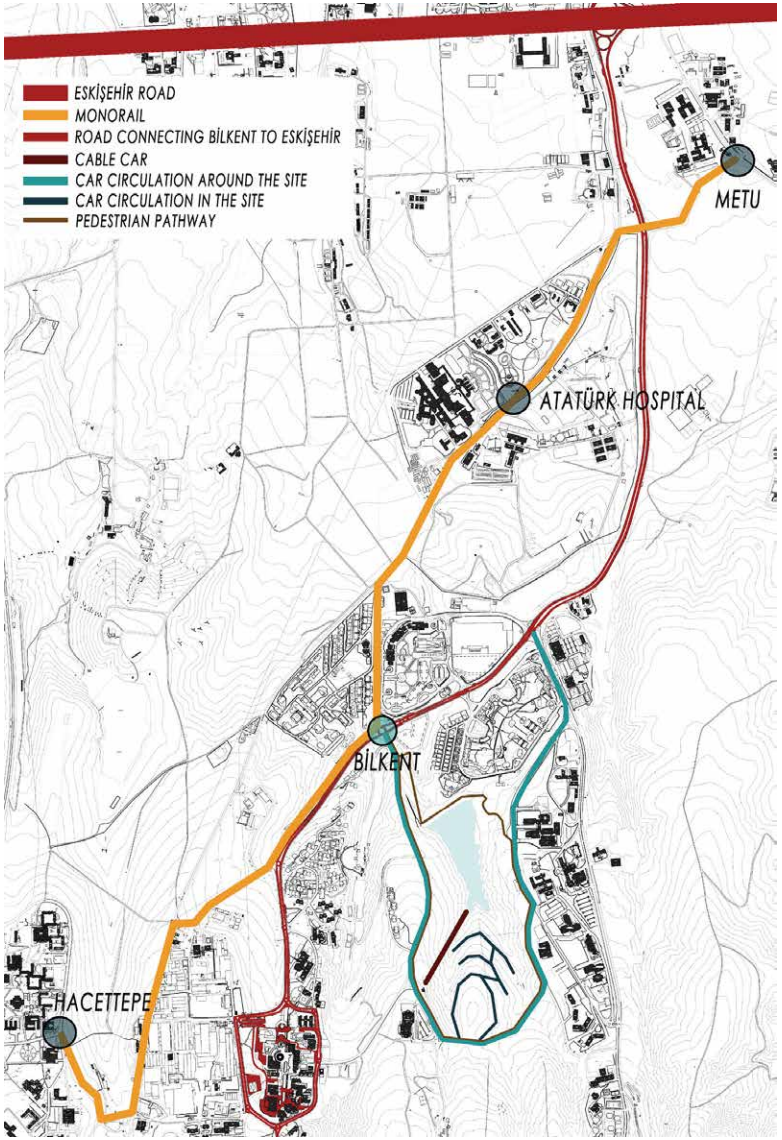






SCIENCE for ALL

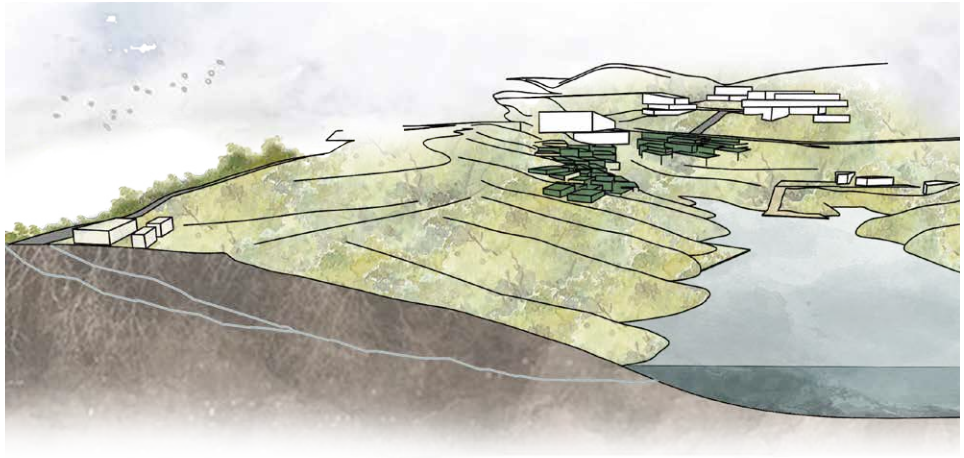
DERIN ŞEN, IPEK TOPALKARA

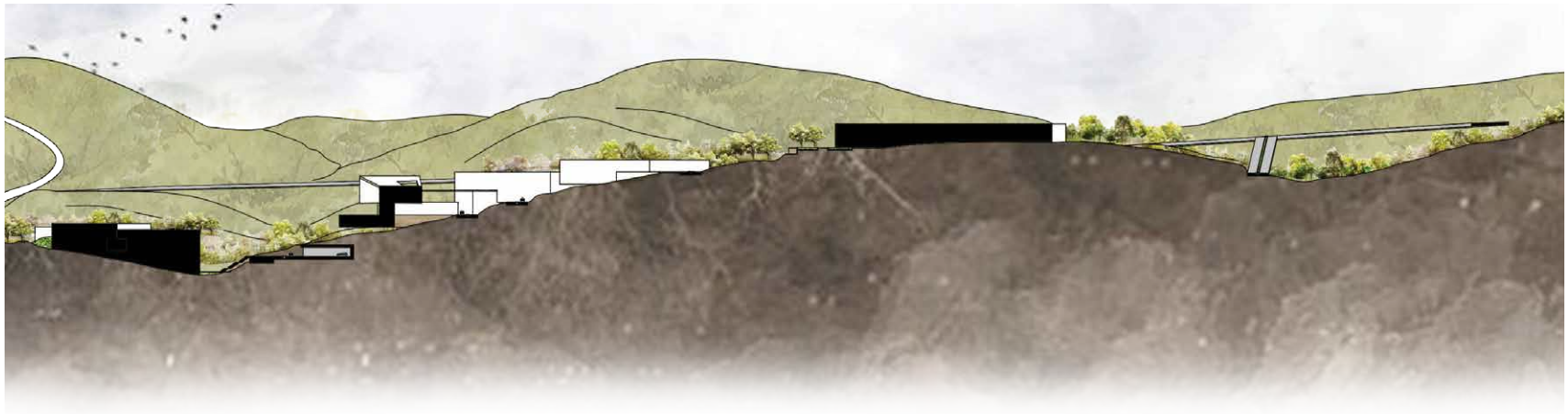


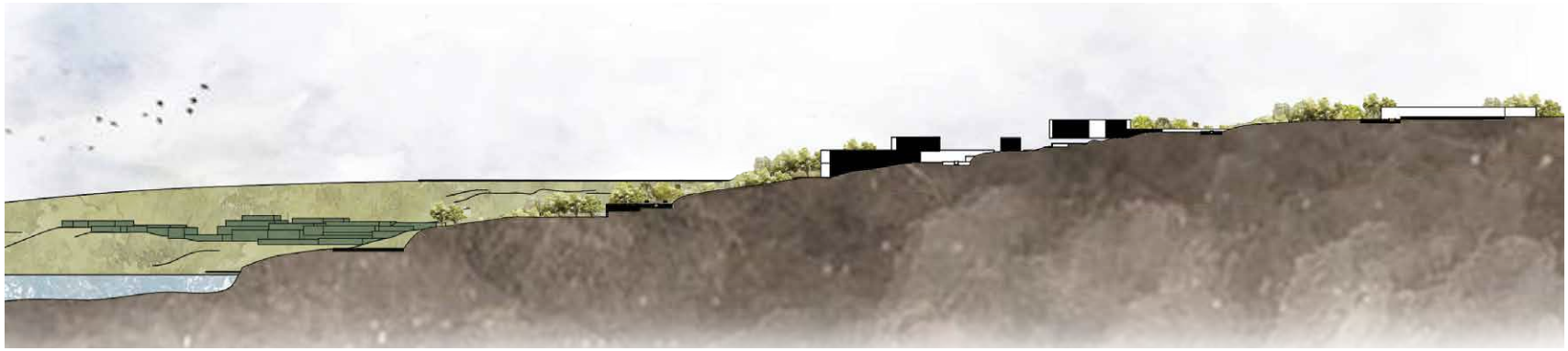
The main inspiration of the whole concept for this proposal is rooting from the literal meaning of the name Bilkent. Hence we as a group wanted to strengthen its essence as the Town of Science and created an area focusing mostly on scientific research and other complementary recreational activities. We decided that all 3 universities in the area need a common research center where they can realize integrative scientific research studies while also maintaining the privacy of their own campus. While deciding on the branches for research studies, instead of focusing on cliches we wanted to create a new medium to enable the exploration of areas such as AI, Robotics, Biomedical, Space, Botanics, Drone and other related sciences which are all considered to be the occupations of the future. Thus yielding in an inovative science campus which both aims to connect the three universities and create an area of recreation.

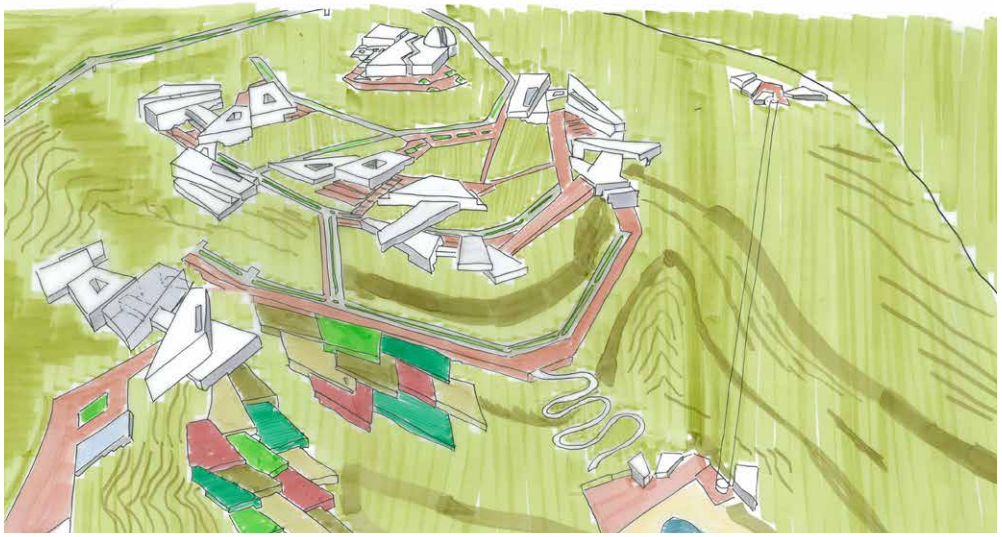
Sustainable design principles are quite important and the starting point of sustainablity in this area beginswith the lake. Even though it is quite small, it can still aid in the functions. For one it is used for the irrigation of the urban agriculture terraces of the Botanical Research Center. In addition it is used for the studies made in Robotics and Drone Development. The site also holds multiple sport facilities that enables people to connect more with the nature. In addition to recreational purposes the addition of water sports both utilizes the lake and makes the water treatment of the lake a necessity due to health concerns. The water treatment is made with the aid of water filtering plants hence contributing to the biodiversity of the site. Bioswales are also utilized to minimize water loss and maximize the efficiency of lake by ensuring its continuity. Other sustainable solutions are kinetic & fluorescent pavements, photovoltaic cells, green wall and vertical agriculture. The site also aims to minize light pollution both to aid the Observatory and to enhance the life quality of the people both on the site and near.

The site also hosts an Alumni & Student Center to ensure that the Alumni of Bilkent also have something to return to, to relive their Bilkent experience. The overall aim was to use the elements of nature, science, human and sports; combined with the site to create a system that is sustainable both environmentally and economically. That is also aiming to preserve the existing ecosystem and aiding its continuation with additional forestation.









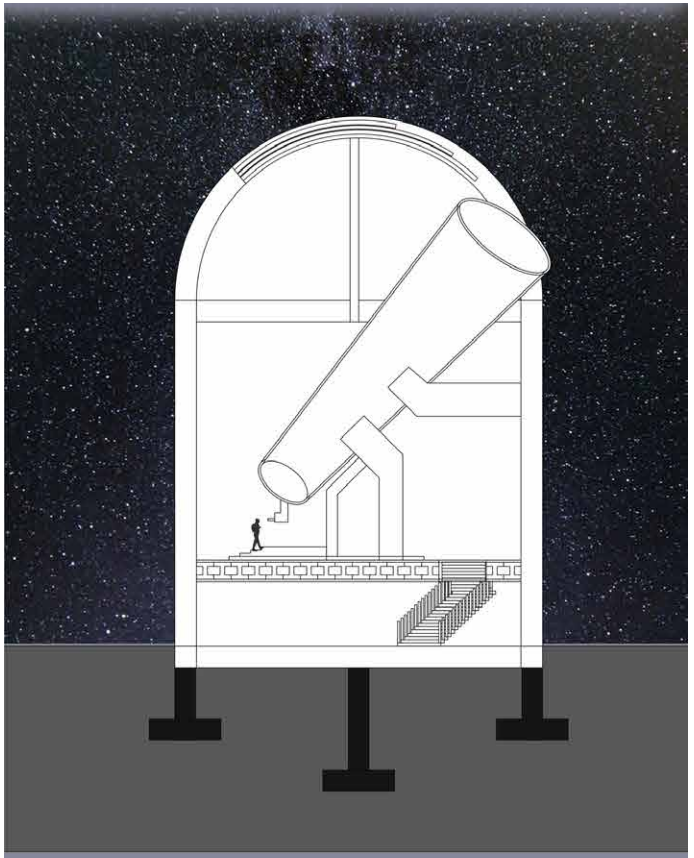
IPEK TOPALKARA

SPACE RESEARCH CENTER

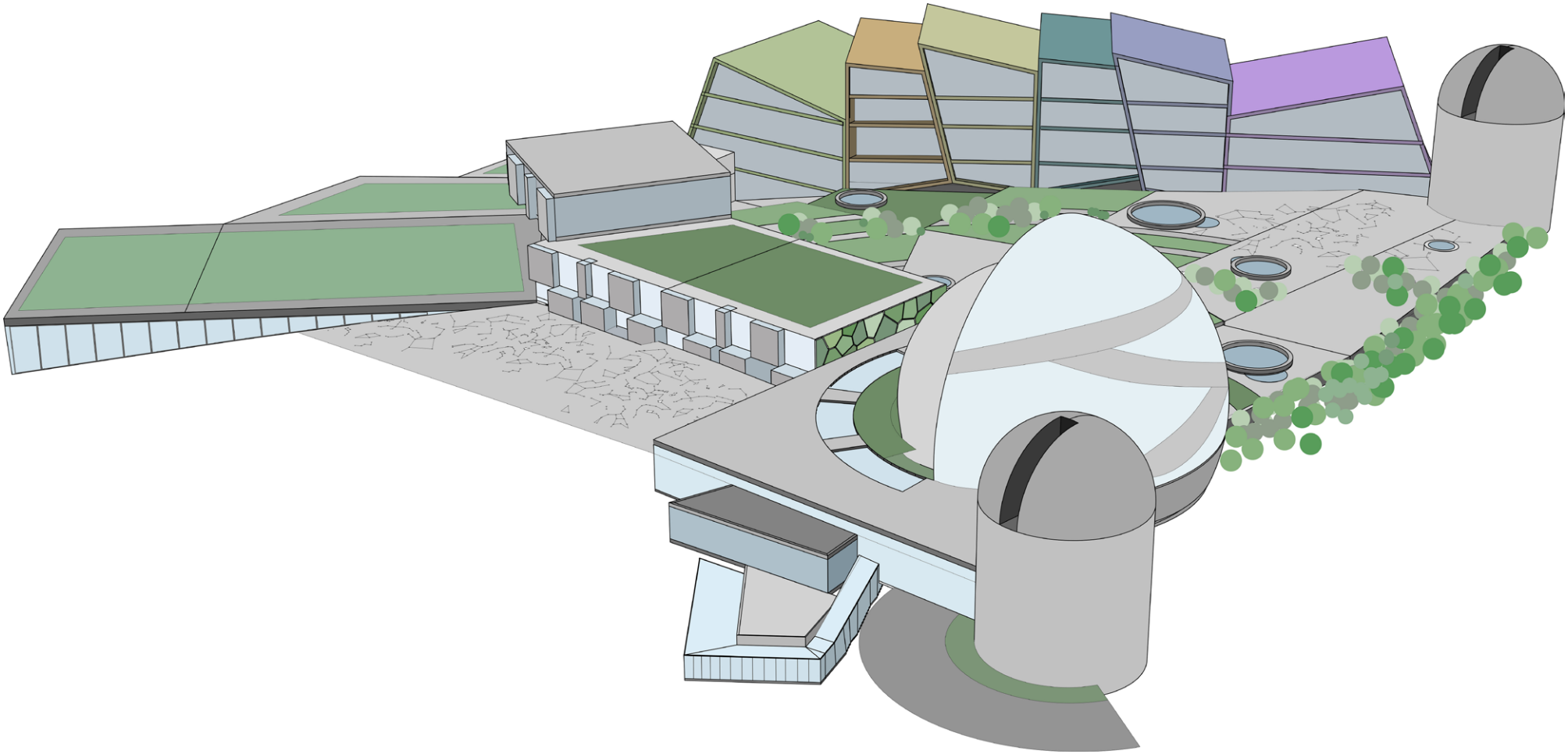
At the beginning of the semester as a group we started this project with the idea of creating an integrative science research campus within close proximity of all three universities. The campus was envisioned as a shared interdisciplinary research facility which would be welcoming to the general public as well.
Another concept of importance both this semester and our projects in general was "sustainability". In addition to its environmental aspects I also wanted my science complex to be financially sustainable within itself and to have the capacity sustain the scientific research and create a budget for it and in a way become an independent entity. Hence I turned it into a 24 hour working complex with dormitories for the research staff for them to comfortable continue their night time observations, a day-care that is free for the children of everyone that works both as a researcher and within the branch of the museum exhibitions, two telescopes as one being public and the other one private, sleeping areas for the visitors, a planetarium, lecture halls, eating areas, a library for both the display of "space related" books and the thesis produced by the researchers working and studying in the complex, a 3D exhibition ramp, anti-gravity chamber, research facilities, permanent and temporary exhibition areas and an overall experience of space.

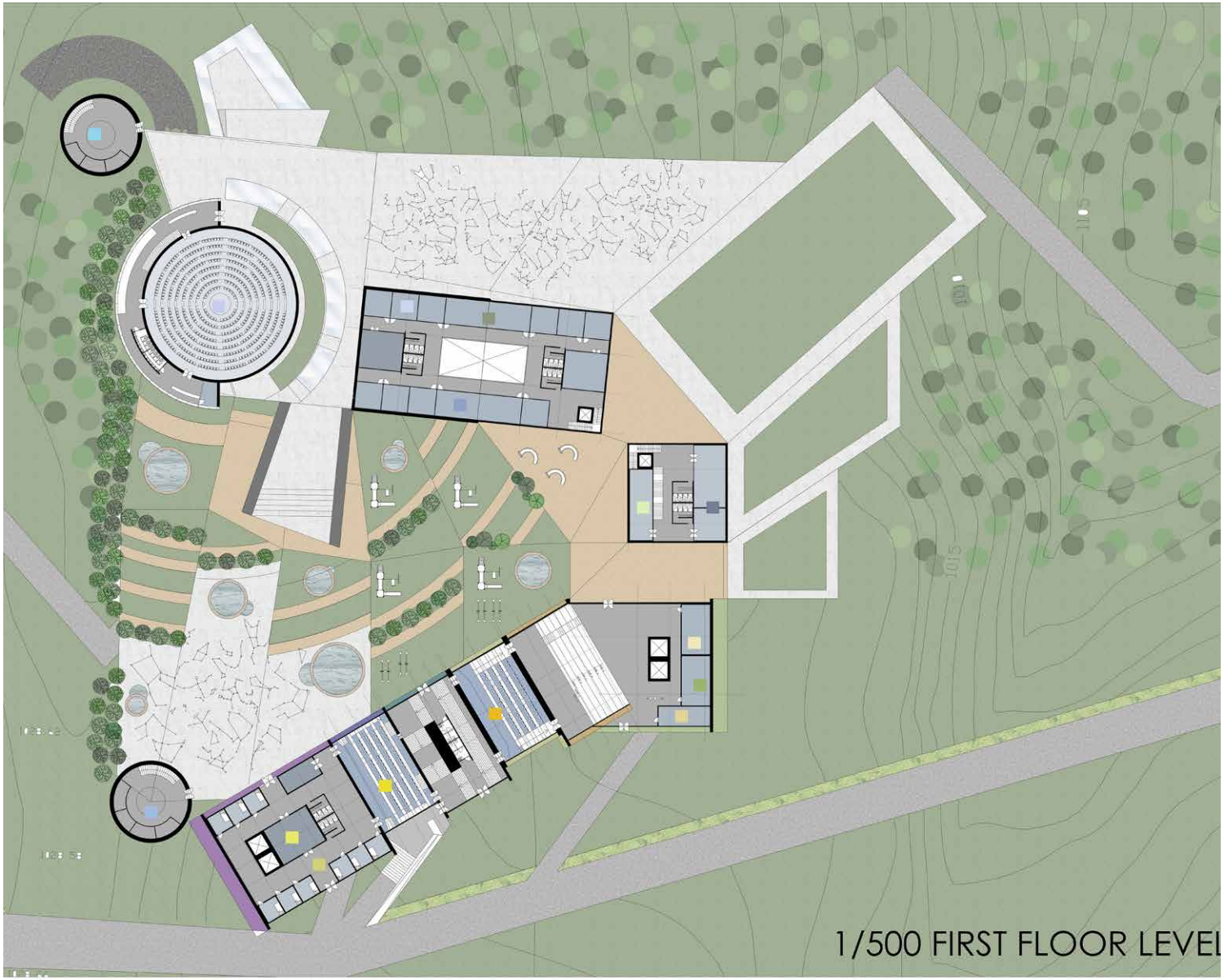
I laid out all of these functions around a central plaza with a fork formation. This plaza works as both a gathering area, an activity space and a vast open area for night time telescope observations. One of the most vital necessities of conducting healthy night time observations is a clear view of the night sky.
The biggest hindrance against this is light pollution, and hence to both minimize light pollution and facilitate a healthy amount of night illumination for the activities I made use of both red spot lights and created a map of the constellations on a night sky and used that for the creation of a pattern on the pavement. These patterns were laid out with sun charged fluorescent pebbles and gave off enough light for people to move around and yet to not disturb the quality of eyesight for the observations. Another strategy was the rainwater collection ponds that both became decorative elements, were used for the toilet flushes and irrigation, and also created cool breezes for the people during summer. The planetarium has a system of interlocking ramps which up to a viewing platform. This platform is not only a gathering space but is also used for the conduction of naked-eye observations during winter when the temperatures are too low for the visitors to wait outside. The ramp system and the glass outer dome of the planetarium are both carried by cylindrical beams that extend out from under the ramp system. These cylinders are also equipped with rotating photovoltaic cell systems which harvest the daylight and use that to power the lighting system and the shows made inside the planetarium dome and the rest is distributed to the other parts of the complex to be used to minimize energy cost and the carbon foot print of the whole system. In a broader sense I saw this final project as an opportunity to combine my passion for astrophysics with architect and had the chance to explore what can be made with their combination.

I generally used the concepts of a night sky, planetary orbits and movements, and contrast while creating my forms. I also had the chance to do futher research on space centers to find more integrative functions to bring my project together and create an imaginary complex that never stops living.



THERE SHOULD BE AN ADEQUATE CLEARANCE ALLOWED BETWEEN THE PIER AND FLOOR TO PROVIDE VIBRATION ISOLATION.
VIBRATION ISOLATION SHOULD BE PROVIDED BUILDING MACHINERY AND FLOOR SO AS TO MINIMIZE VIBRATIONS INDUCED INTO THE BUILDING.
SEPARATE FOOTING AND FOUNDATION ARE REQUIRED FOR THE PIER AND DOME WALLS
THE PIER IN THIS CASE IS REINFORCED CONCRETE
THERE SHOULD BE AN UNOBSTRUCTED 7 TO 10 DEGREES ABOVE HORIZON.
THE PUBLIC OBSERVATORY IN THIS PROJECT HAS A BIG ENTRANCE HALL IN THIS PROJECT FOR THE GUESTS
WHEREAS THE PRIVATE RESEARCH TELESCOPE IS ALSO EQUIPED WITH A SMALL SCALE COMPUTER LAB TO ENABLE RAPID MONITORING OF THE OBSERVATIONS AND DATA COLLECTION CONNECTED WITH THE VISUALISATION.

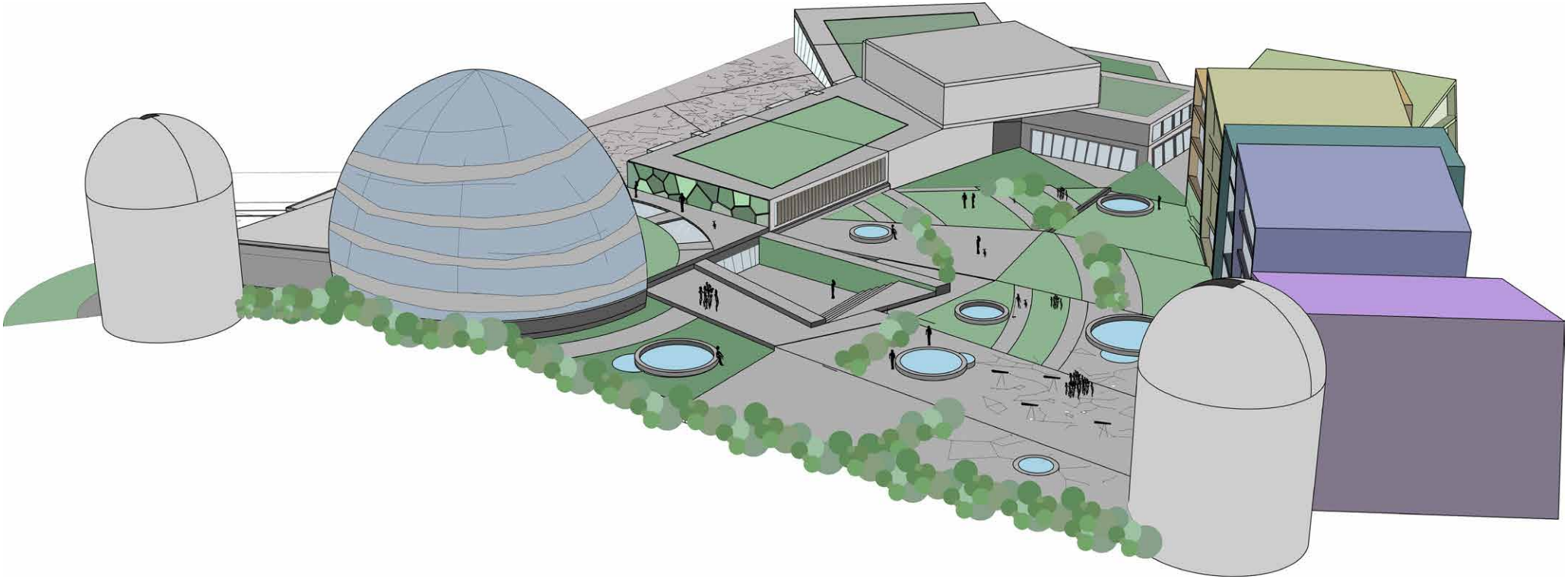


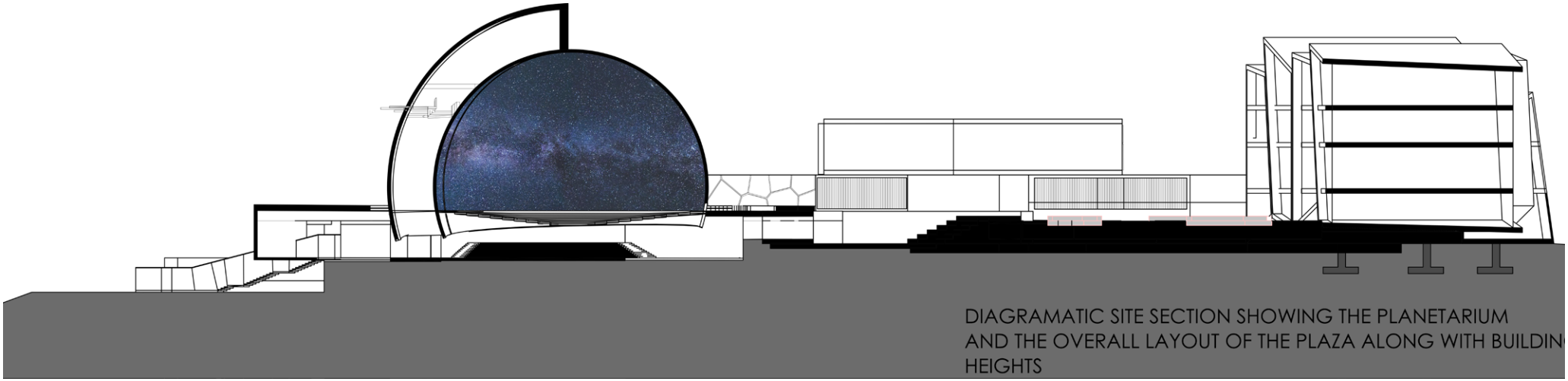


ELESCOPE
RESEARCH TELESCOPE
H STAFF SLEEPING AREA
ER LABORATORY
HALL 1
HALL 2
ON OFFICE
H STAFF MEETING HALL
EWING CAFE AND GUEST MEETING AREA

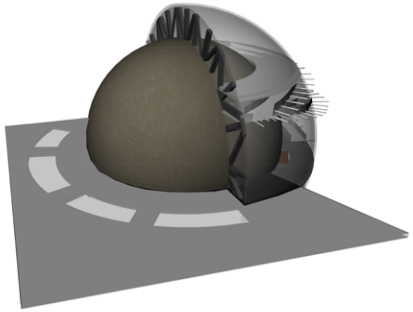
N OFFICES

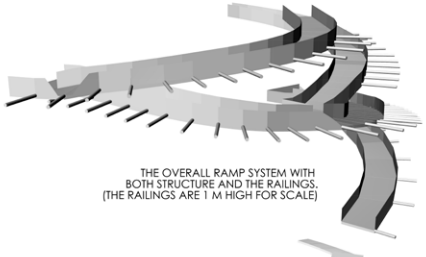
PUBLIC LABORATORY
RESEARCH STAFF OFFICES
EXHIBITION STAFF OFFICES
PLANETARIUM



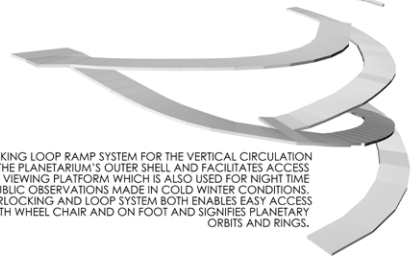


DIAGRAMATIC SITE SECTION SHOWING THE PLANETARIUM AND THE OVERALL LAYOUT OF THE PLAZA ALONG WITH BUILDIN HEIGHTS

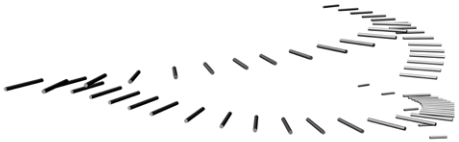




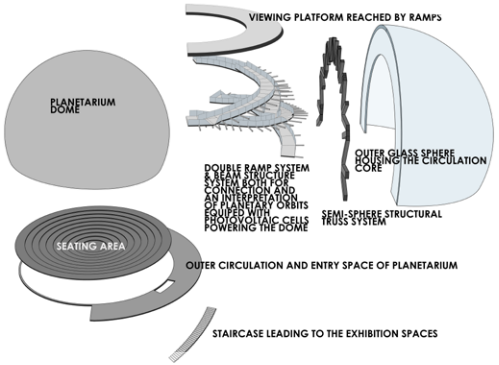
THE OVERALL RAMP SYSTEM WITH BOTH STRUCTURE AND THE RAILINGS. (THE RAILINGS ARE 1 M HIGH FOR SCALE)

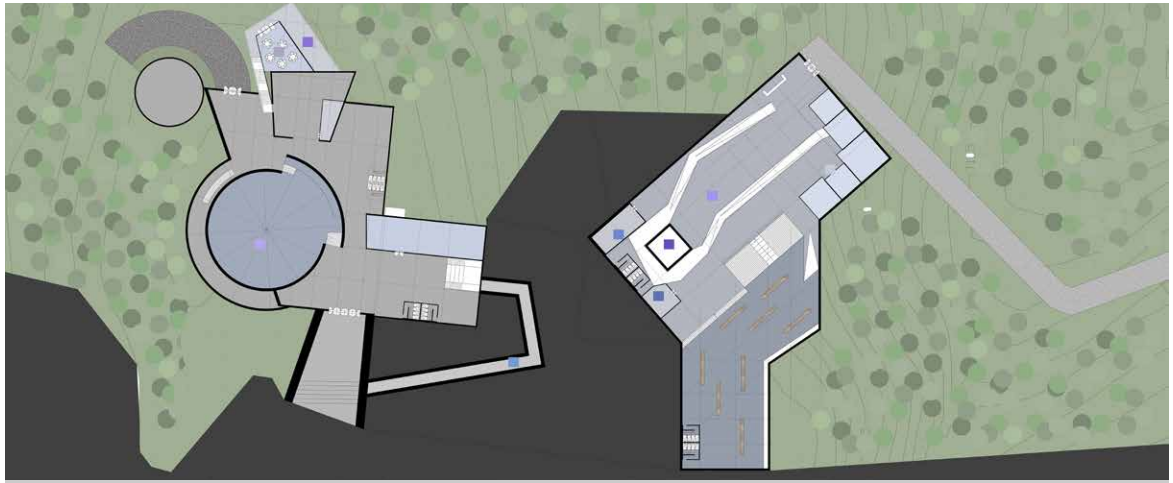


INTERLOCKING LOOP RAMP SYSTEM FOR THE VERTICAL CIRCULATION INSIDE THE PLANETARIUM'S OUTER SHELL AND FACILITATES ACCESS TO THE VIEWING PLATFORM WHICH IS ALSO USED FOR NIGHT TIME PUBLIC OBSERVATIONS MADE IN COLD WINTER CONDITIONS. THE INTERLOCKING AND LOOP SYSTEM BOTH ENABLES EASY ACCESS BOTH WITH WHEEL CHAIR AND ON FOOT AND SIGNIFIES PLANETARY ORBITS AND RINGS.

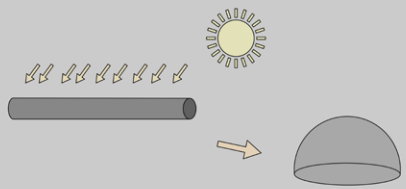


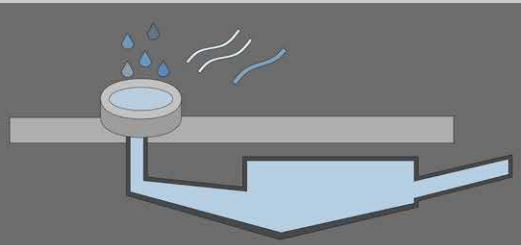
STRUCTURAL BEAMS CARRYING THE RAMP AND THE SEMI-SPHERE GLASS DOME. THESE ARE ALSO EQUIPED WITH PHOTOVOLTAIC CELLS GENERATING ELECTRICITY TO BE USED FOR THE POWERING OF THE INTERIOR DOME. THE FORM IS INSPIRED BY PLANETARY ORBITS AND RINGS. MARKING THE PROJECTION OF THE RAMP ON THE OUTER SHELL.



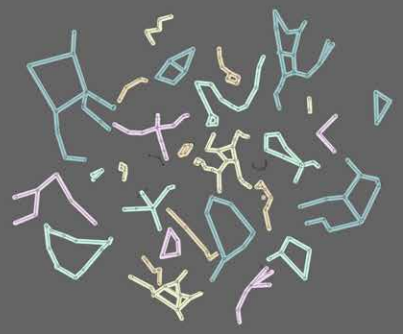


THE STRUCTURAL TUBES WHICH WORK AS A BEAM SYSTEM FOR THE RAMP OF THE PLANETARIUM ARE ALSO EQUIPPED WITH ROTATING PHOTOVOLTAIC CELLS WHICH FOLOW THE MOVEMENT OF THE SUN THROUGHOUT THE DAY. THE ENERGY CREATED BY THESE PHOTOVOLTAIC CELLS ARE UTILIZED BOTH FOR THE POWERING OF THE DEMONSTRATIONS MADES INSIDE THE PLANETARIUM AND ALSO CONTRIBUTES TO THE WATER HEATING SYSTEM. HENCE CREATING A MORE ENERGY EFFICIENT DESIGN. SUCH CELLS ARE ALSO LOCATED ON THE SOUTH- SOUTHEAST FAÇADE OF THE RESEARCH BUILDING EMBEDDED INSIDE THE SOLAR SCREENING MESH.

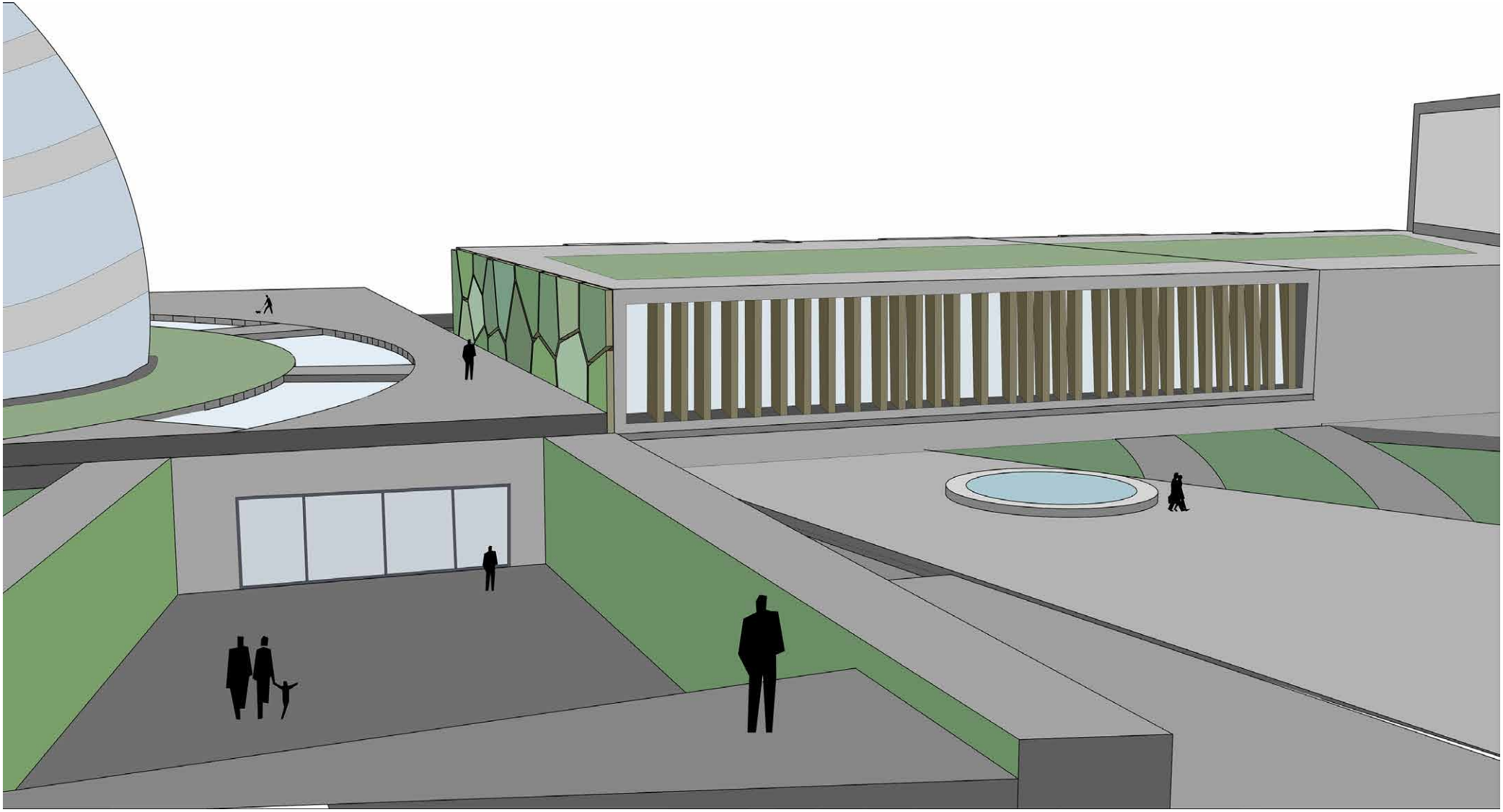




THE SMALL PONDS LOCATED ON AROUND ON THE CENTRAL PLAZA ARE ALL CONNECTED TO A RAINWATER COLLECTION SYSTEM WITH A BIG STORAGE UNIT. THIS WATER CAN BE USED FOR THE FLUSHING SYSTEM AND THE IRRIGATION OF THE SOFTSCAPE LOCATED ON THE PLAZA HENCE MINIMIZING WATER WASTE. IN ADDITION TO THAT USAGE THESE PONDS ALSO HELP COOL DOWN THE PLAZA BOTH FOR THE GUESTS AND RESEARCH STAFF DURING THE HOT SUMMER TIME AND CREATES BREEZES ALONG WITH THE LAYOUT OF THE PLAZA.



A CLEAR AND DARK NIGHT SKY IS ONE OF THE MAIN REQUIREMENTS WHEN CONDUCTING NIGHT SKY OBSERVATIONS BOTH FOR LEISURE AND RESEARCH PURPOSES. FOR THAT REASON LIGHT POLLUTION HAS TO BE KEPT AT A MINIMUM AT ALL TIMES FOR THIS AREA. HENCE SOLAR POWERED GLOW-IN-THE-DARK PEBBLES ARE EMBEDDED INSIDE THE PAVEMENT FOR THE OPEN AIR PARTS OF THE PLAZA WHICH NOT ONLY FACILITATE CIRCULATION BUT ARE ALSO USED FOR NIGHT TIME OBSERVATIONS OF THE VISITORS. INSTEAD OF RANDOMLY LAYING OUT THESE PEBBLES I DECIDED TO CREATE A MAP OF THE MAIN CONSTELLATIONS SEEN ON THE NIGHTSKY OF THE NORTHERN HEMISPHERE AND USED IT AS A GUIDELINE FOR THE LIGHTING SYSTEM. IT ONLY RELIES ON THE FLUCTUATION OF DAY AND NIGHT ALONG WITH NATURAL LIGHT. THESE PEBBLES ARE CHARGED DURING THE DAY AND GIVE OFF ENOUGH GLOW DURING NIGHT TO FACILITATE SAFE MOVEMENT YET NOT STRONG ENOUGH TO HINDER THE CONDUCTION OF HEALTHY OBSERVATION.



DERİN ŞEN

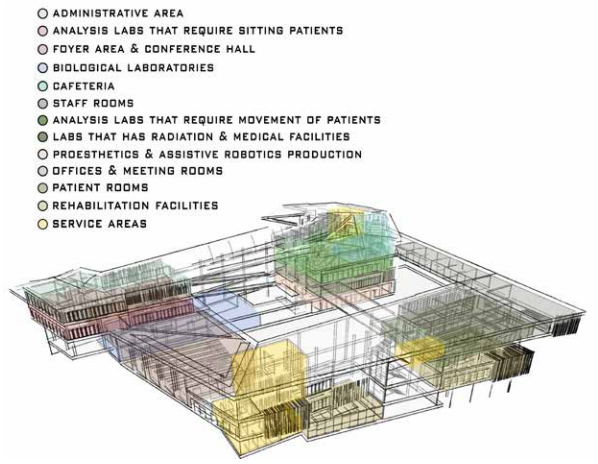
BIOMEDICAL RESEARCH CENTER

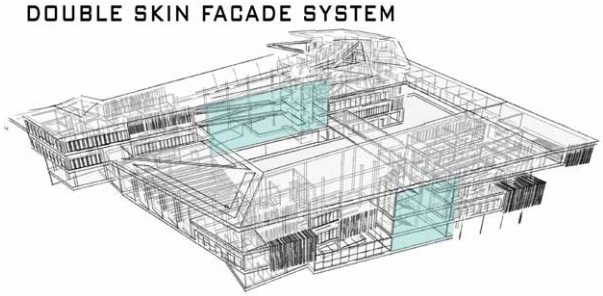
The Biomedical Research Center serves the whole city, especially the patients from the Atatürk Hospital. Also technicians, scientists, and students from METU and Hacettepe can access the building by monorail easily. The building has a design that people with physical disabilities can move easily between the floors through ramps that are inside and outside of the building. The building has access from outside almost on all floors. In addition to being able to analyze, treat and rehabilitate the health status of patients in the building, prosthetic and assistive robotics production also are available.

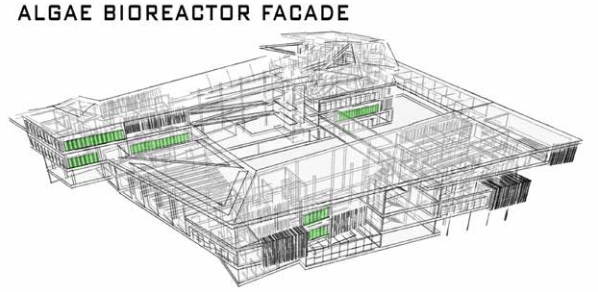
The building in general consists of two masses and two bridges connecting these two masses. The entry floor consists of public areas that both employees and patients can benefit from. Over the bridge that connects the two masses is used as a terrace for the cafeteria. On the minus first floor of the main building, there are analysis labs based on the movements of the patients and the reactions they give. A bridge with offices in this floor is connected to the opposite building and the floor on which it is connected has functions such as meeting room and lecture rooms. On the minus second floor, there is a section where there are devices with radiation danger, as well as neuroprosthetics surgery rooms and are connected to patient's rooms on the opposite side of the bridge. The foyer area of the lecture hall is also on this floor. On minus third floor, there are biology labs and a section that dedicated to the production of prostheses and assistive robotics. There are functions for the rehabilitation treatment on the same floor on opposite building. And for the minus fourth floor, there is a pool for rehabilitation purpose. Plans and structural systems were developed to provide a logical connection between corridors and room dimensions. In this way pedestrian circulation became clearer.

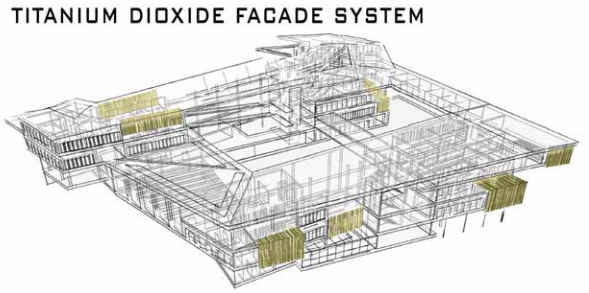
Sustainable decisions was important while designing the building, because the site needs to be protected and it has a great potential to be able to use various sustainable systems. The roof of the main building is integrated with the topography itself and was developed in the form of an airplane wing so that air circulation could be better achieved. Rainwater collection integrated roof system is also used for the roof and the form of the roof facilitates the collection of rainwater. For the other roof, again rainwater collection integrated green roof system is used. On top of the gallery spaces in the main building, there are three glass wind tower in order to provide better natural ventilation and also due to the lighting issues on the lower floors, and it is integrated with photovoltaic cell system. Thus when producing solar energy, they also provide sun shading.

Different facade systems are developed according to facade requirements and functions. Some areas are left open to sun exposure in order to take the light inside the building due to function requirements. On southeast facades, double skin façade system is used as a passive sustainable system. Also for other facades, interactive façade systems, sun shades and louvers are designed. The window panels are adjustable according to sun angle in order to control the sun amount that enters the building. Another main sustainable feature is the algae bioreactor facade system that is integrated with adjustable window panels. That system detects pollution and absorbs carbon dioxide while releasing oxygen, also produces biomass and hydrogen. Some glazing had a titanium dioxide facade system in front of them to function as sun breakers. The feature of the titanium dioxide facade is that they react with light to neutralize certain pollutants in the air, converting them to inert salts, steadily purifying the atmosphere. There are green walls on some parts of the facades and they also can be used as vertical farming areas.

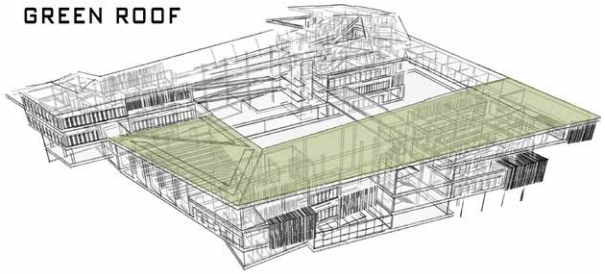




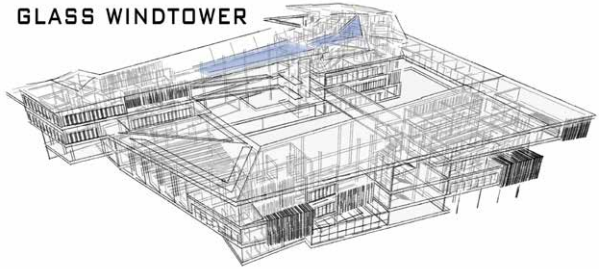




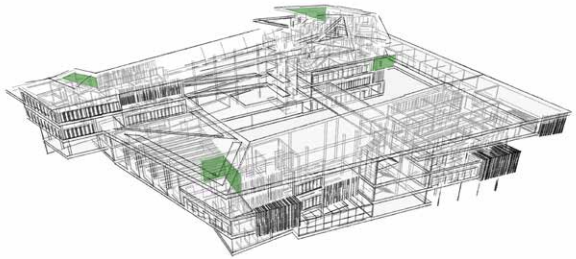
GREEN ROOF



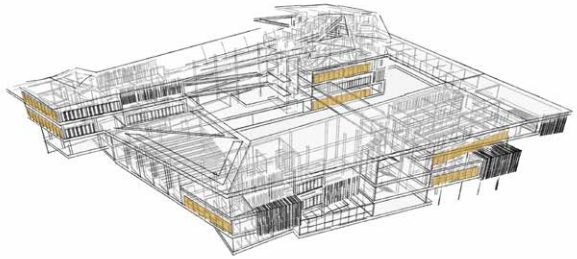
PHOTOVOLTAIC CELL INTEGRATED
GLASS WINDTOWER

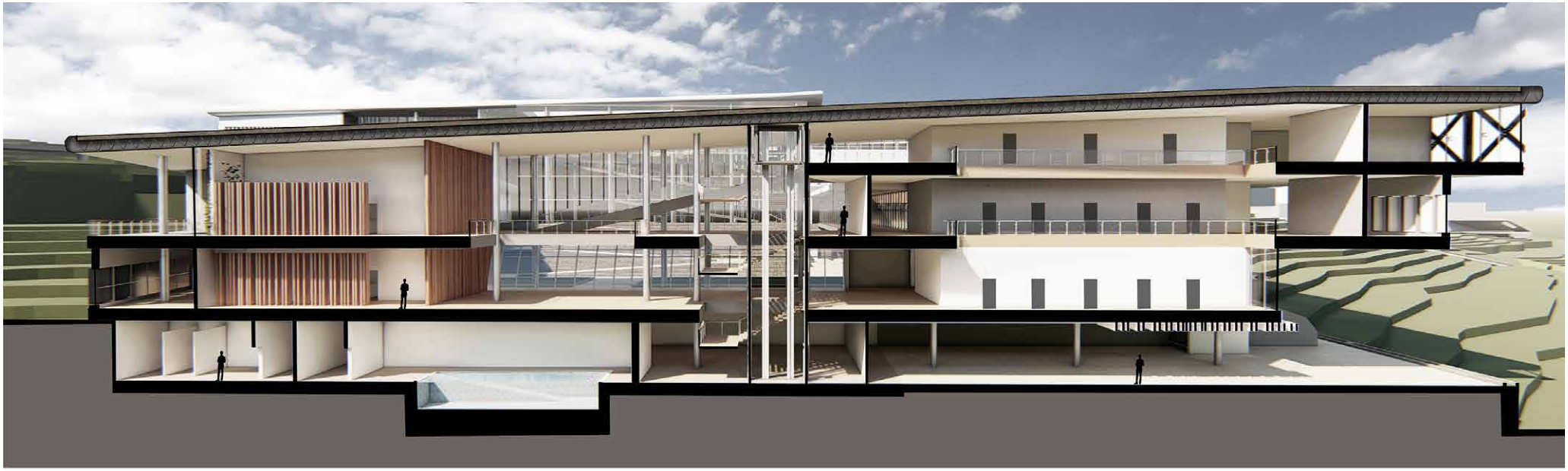


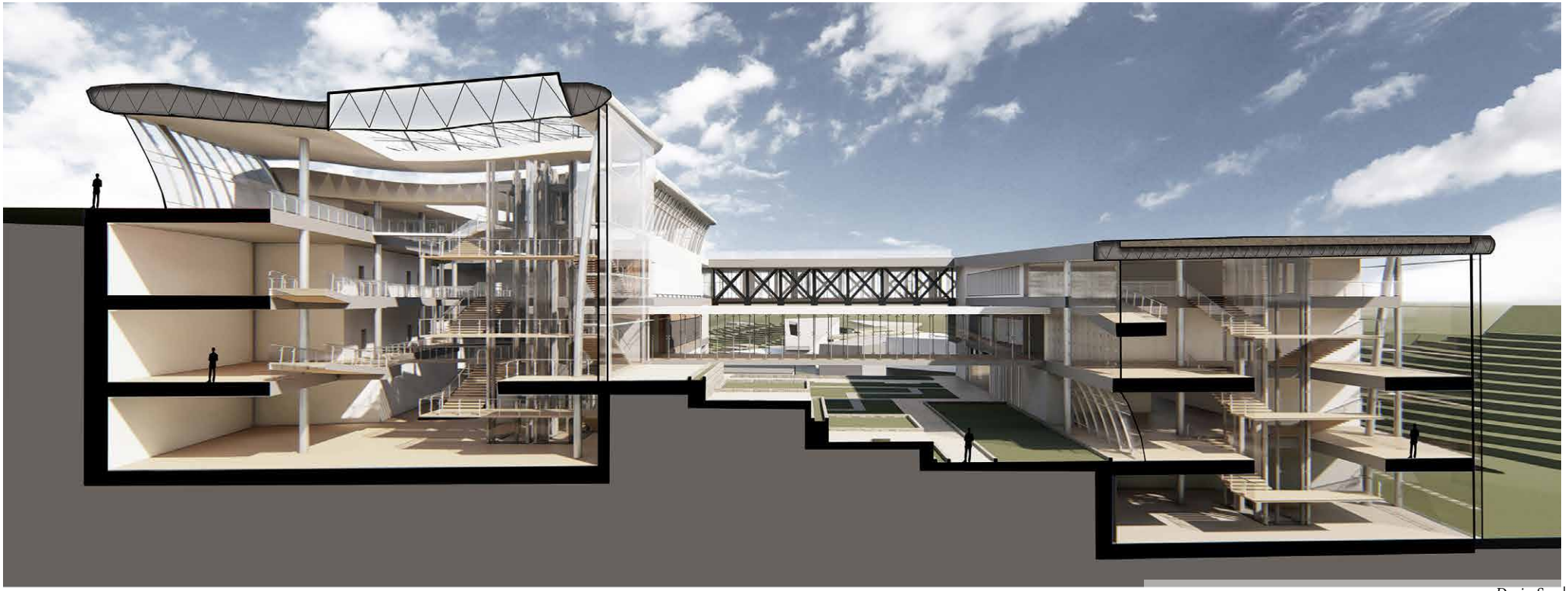
VERTICAL GARDEN



ADJUSTABLE SUN LOUVERS





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