GATED LANDSCAPES:
METU FOREST AND THE FORMATION OF A TOPOLOGICAL GROUND

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

SARA RRAJA

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF ARCHITECTURE
IN
ARCHITECTURE

AUGUST 2022

Approval of the thesis:

GATED LANDSCAPES: METU FOREST AND THE FORMATION OF A TOPOLOGICAL GROUND

submitted by **SARA RRAJA** in partial fulfillment of the requirements for the degree of **Master of Science** i**n Architecture, Middle East Technical University** by,

Prof. Dr. Halil Kalıpçılar
Dean, Graduate School of **Natural and Applied Sciences** _____

Prof. Dr. F. Cana Bilsel
Head of the Department, **Architecture** _____

Prof. Dr. Ayşen Savaş Sargın
Supervisor, **Architecture, METU** _____

Examining Committee Members:

Assoc. Prof. Dr. Funda Baş Bütüner
Architecture, METU _____

Prof. Dr. Ayşen Savaş Sargın
Architecture, METU _____

Assist. Prof. Dr. Duygu Tüntaş
Architecture, TEDU _____

Date: 29.08.2022

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name Last name: Sara Rraja

Signature:

ABSTRACT

GATED LANDSCAPES: METU FOREST AND THE FORMATION OF A TOPOLOGICAL GROUND

Rraja, Sara
Master of Architecture, Architecture
Supervisor: Prof. Dr. Ayşen Savaş

August 2022, 104 pages

With the first tree planted in December 1961, METU Campus' Afforestation Project was a crucial move in the formation of the campus as an establishment of autobiography, which documents a higher aspiration for change in the whole society. The Campus' Forest, which transforms into a well-thought landscape design as it approaches the main campus, forms a sustainable, ecologic, and endurable ecosystem in the midst of the city. The campus landscape becomes a physical entity and ensures its endurance depending on what it initiates, provides, activates, and inspires. This thesis focuses on the intricate landscape relationship and interaction with architecture, its aesthetical cohesiveness, and all elements that assemble it as a whole. It examines the landscape of the campus in its topological terms: its spatial relations in terms of connective properties. METU Campus, a human-made forest centralized with a designed landscape, unfolds various layers of aesthetics and meanings and performs effectively in sustaining the campus' needs. The campus, dating from the 1960s, is an example of a successful topological landscape design, a term used first in 2011 in the field. The thesis is a documentation and a representation, at the same time, of the landscape and all its elements that form the topology of the ground on the campus.

Keywords: Forest, Landscape, Topology, Architecture, METU Campus

ÖZ

KAPALI PEYZAJLAR:
ODTÜ ORMANI VE TOPOLOJİK ZEMİN OLUŞUMU

Rraja, Sara
Yüksek Lisans, Mimarlık
Tez Yöneticisi: Prof. Dr. Ayşen Savaş

Ağustos 2022, 104 sayfa

Aralık 1961'de dikilen ilk ağaçla, ODTÜ Kampüsün Ağaçlandırma Projesi, tüm toplumda daha yüksek bir değişim arzusunu belgeleyen bir otobiyografi kuruluşu olarak kampüsün oluşumunda çok önemli bir hamle oldu. Ana kampüse yaklaştıkça iyi düşünülmüş bir peyzaj tasarımına dönüşen Kampüs Ormanı, şehrin ortasında sürdürülebilir, ekolojik ve dayanıklı bir ekosistem oluşturuyor. Kampüs peyzajı fiziksel bir varlık haline gelir ve neyi başlattığı, sağladığı, etkinleştirdiği ve ilham verdiğine bağlı olarak dayanıklılığını sağlar. Bu tez, mimari ile karmaşık peyzaj ilişkisi ve etkileşimi, estetik uyumu ve onu bir bütün olarak birleştiren tüm unsurlara odaklanmaktadır. Kampüsün peyzajını topolojik terimleriyle inceler: mekânsal ilişkileri bağlantı özellikleri açısından. Tasarlanmış bir peyzaj ile merkezileştirilmiş insan yapımı bir orman olan ODTÜ Kampüsü, çeşitli estetik ve anlam katmanlarını ortaya çıkarır ve kampüsün ihtiyaçlarını karşılamada etkin bir şekilde çalışır. 1960'lardan inşa edilmeye başlanmış bu kampüs, alanında ilk kez 2011 yılında kullanılan bir terim olan başarılı bir topolojik peyzaj tasarımı örneğidir. Tez, aynı zamanda peyzajın ve kampüsteki zeminin topolojisini oluşturan tüm unsurlarının belgelenmesi ve temsilidir.

Anahtar Kelimeler: Orman, Peyzaj, Topoloji, Mimarlık, ODTÜ Kampüsü

to my little brother,

ACKNOWLEDGMENTS

I wish to express my deepest gratitude to my supervisor Prof. Dr. Ayşen Savaş, for her guidance, advice, and criticism throughout this process. Possessing a unique understanding of architecture, having a visionary attitude, and always thinking out of the box, she has been an inspiration for me over the past years.

I express my sincere thanks to my jury members committee Doç. Dr. Funda Baş Bütüner and Assist. Prof. Dr. Duygu Tüntaş for their valuable and useful critics.

I also am very thankful to everyone whom I crossed paths with, who patiently listened and contributed to my thoughts.

I must be a very lucky person to have by my side friends like Penet Kokalari and Eva Shkreli, who have supported me thoroughly and always pushed me to do better. They are everything one should ask for in a friend. This journey would have been much harder without their presence. I also want to thank Sabrina Shurdhi, who stood by my side this whole process, she is one of a kind. I could not skip a warm thank you for my lovely friends and Yeliz and Seray.

My gratitude also goes to Busra Sonmez, together with every person in our small group of friends. Thank you for being there and trusting in me.

Last but not least, I want to thank my family, my mother, Manjola Rraja, my father, Flamur Rraja, and my brother, Ariel Rraja for loving me unconditionally and supporting every decision of mine. Words cannot express how grateful I am to have you in my life.

TABLE OF CONTENTS

ABSTRACT v

ÖZ vii

ACKNOWLEDGMENTS x

TABLE OF CONTENTS xi

LIST OF FIGURES xiii

1 INTRODUCTION 1

1.1 Landscape design and its evolution towards topology 2

1.2 Topology in mathematics 5

1.2.1 The emergence of topology as a discipline 7

1.3 Topology in Landscape 8

1.4 METU Campus Landscape 9

1.5 Aims and Objectives 10

1.5.1 Methodology Research and Hypothesis 11

1.5.2 Outline of the thesis 12

2 TOPOLOGY IN LANDSCAPE 15

2.1 The topological thinking 15

2.1.1 Topology in/and Landscape 16

2.2 A Topological Approach 17

2.2.1 Topology, the future of design 19

3 METU CAMPUS: AN IDEAL LANDSCAPE 21

3.1 METU Landscape: It all started with a dream 21

3.1.1 Afforestation of METU Campus 25

3.2 Landscapes of Change 28
3.3 The formation of a Topological Ground 36
3.4 A Gated Landscape 42
3.4.1 Gates 44
3.5 Landscape Aesthetics 47
4 METU CAMPUS AS A TOPOLOGICAL GROUND 52
4.1 Understanding topological features 52
4.2 The Grid 57
4.3 The Network 59
4.3.1 Coupling as the basis for interrelations in topology 64
4.3.2 The Whole and Proximity 76
4.4 The Activity Layout 81
4.4.1 Places of assemblage and momentary assemblage 83
5 CONCLUSION 91
A. Middle East Technical University (Information) 101
B. Site plan of METU Campus 102
C. Reports about METU Campus 103

LIST OF FIGURES

FIGURES

Figure 1.1: Möbius Strip 6
Figure 3.1: A part of the METU Forest as seen from the main library 22
Figure 3.2: The two centers working on the afforestation project 24
Figure 3.3: Tree planting festival, organized each academic year 27
Figure 3.4: METU Campus before afforestattion project 28
Figure 3.5: Landscapes of the Campus 31
Figure 3.6: Habitats shaped by METU Campus Landscape 32
Figure 3.7: Map about the afforestation of the campus, 1958 34
Figure 3.8: Afforestation Process of the Campus 35
Figure 3.9: Site plan of METU Campus 37
Figure 3.10: Various sceneries on the campus 38
Figure 3.11: The area between rectorate building and cafeteria 39
Figure 3.12: The locations of the gates of the campus 44
Figure 3.13: A1 46
Figure 3.14: A9 and A7 Gates 47
Figure 3.15: First years of afforestation project 48
Figure 3.16: First years of afforestation project 49
Figure 3.17: Recent photo from the forest of the campus 49
Figure 3.18: Landscape inside the main campus 50
Figure 3.19: Landscape outside the main campus 51
Figure 4.1: Open set principle 53
Figure 4.2: Imagining topological connectivenes 54
Figure 4.4: Alexander's semilattice structure 56
Figure 4.4: Alexander's tree like hierarchical structure 56
Figure 4.5: Abstract representation of the 3D Grid of the campus 58
Figure 4.6: Abstract mapping of the interconnectedness inside the campus 61

Figure 4.7: Interconnection of the paths and pathways of the campus 62
Figure 4.8: Mind map of how topological spaces are formed 63
Figure 4.9: Interrelations by coupling 65
Figure 4.10: Coupling via contrast in texture 66
Figure 4.11: Main library building 67
Figure 4.12: Coupling via conrast in color 68
Figure 4.13: Coupling via interpenetration 69
Figure 4.14: Boolean Unity 70
Figure 4.15: Coupling via permeability 71
Figure 4.16: Framing the landscape 72
Figure 4.17: Coupling via a third element 73
Figure 4.18: Coupling via a third element 74
Figure 4.19: Coupling via inflection 75
Figure 4.20: The whole METU Campus is an act of ftagmentation 76
Figure 4.21: The whole, as explained by Alexander 77
Figure 4.22: Abstract illustration of the formation of circumstantial centers 78
Figure 4.23: Topological diagram 80
Figure 4.24: Topological diagram of architecture building 81
Figure 4.25: Boundaries between nature and architecture generate life in campus 82
Figure 4.26: Pathways of the campus, permeable membrane boundaries 84
Figure 4.27: Entrance of the library building, transition spaces 85
Figure 4.28: Places for staying 86
Figure 4.29: Low scale elements and urban furniture 87
Figure 4.30: Abstract representation of the landscape and hardscape of the campus 89

CHAPTER 1

INTRODUCTION

"The original function and infrastructure of Modernist buildings has been subject to change, failing to meet the contemporary needs of its occupants. Today these buildings are under the risk of irreversible alteration, demolition, or destruction. As a result, there is an increased need for architectural conservation initiatives targeting Modernist heritage."[1]

This thesis is an elaborate study made upon Middle East Technical University Campus, initiated by the Getty Conservation Institute, "Keeping It Modern" program. This foundation, for years, has aimed to advance a greater understanding and preservation of the visual arts around the world by developing and overseeing different grants that support further research and conservation in the field, particularly architecture. In 2014, the Foundation launched the "Keeping it Modern" grant, an international initiative that focuses on the conservation of modern architecture from all over the world. In 2017, METU Campus also benefited from this project of the Getty foundation, which focuses on the conservation and preservation of the significant and architecturally valuable buildings of the 20th

[1] Ayşen Savaş, Bengisu Derebaşı, İpek Gürsel Dino, Sezin Sarıca, F. Serra İnan, and Şahin Akın, eds., "Research and Conservation Planning for the METU Faculty of Architecture Building By Altuğ- Behruz Çi ni ci , Ankara, Turkey," *Keeping It Modern Project Report, Getty Foundation*, 2018

century by mostly addressing their values, challenges, and risks they might encounter.

All the research works being made for this project aim to cover different perspectives and subjects able to inform, represent, archive, and rediscover the values of METU Campus. This thesis, in particular, will invest in elaborating the afforestation project and the landscape design of the main campus, as an emergent of the forest itself. Integrated in a premediated forest; METU Campus and its landscape, give life to a new concept in Turkey, being a gated landscape of an urban scale. Hosting individual layers of meaning; physical as well as intellectual, inscribed in the surface of its landscape, METU Campus is a ground of topologic values, to be researched and discovered further. The research aims to extend the understanding of the landscape of the campus while analyzing its design; the elements and details and its relationship with the architecture of the campus; while focusing on how, as a whole, it functions as a topological ground. The relation between architecture, landscape and most importantly the users is studied in different frameworks of scale, emphasizing how these connections and interrelations generate to form complex yet coherent places.

1.1 Landscape design and its evolution towards topology

"There is no spot of ground, however arid, bare or ugly, that cannot be tamed into such a state as may give an impression of beauty and delight".[2]

Landscape architecture as a modern discipline is a very young profession yet landscaping and landscape design has been parallelly evolving together with the history.[3] Cultures through time have learned to design their environments to adjust to their necessities and demands, to facilitate and refine their everyday practices.

---

[2] Gertrude Jekyll, "Home and Garden: Notes and Thoughts, Practical and Critical, of a Worker in Both", p.277, *Cambridge University Press,* 2011.

[3] Norman Booth, Foundations of Landscape Architecture, 2011.

While the progression of landscape as a practice augments each day, its identity as a discipline and its potential also alters accordingly. As Geisen in her "Ritual Landscape and Performance" book explains, in different time periods and/or geographies, people have attained various attitudes towards landscape and what the former should represent. In very early periods, Geisen elaborates, landscape was a canvas for the cultures to recreate and express their beliefs, sacred meanings, and spiritual significances of natural phenomena. The perception about and the approach towards landscape and its designing changed, transformed and evolved each century, depending on cultural, socio-political and/or economical changes of the pertaining time. Up until the 17th century, interaction with nature was of crucial role for various cultures, vastly emphasized in landscape design, a sublime approach which was latter suppressed by the desire for power and authority, as Boults and Sullivian suggest (2010). Designing landscape transformed to an act of illustrating the human will, mostly those of royal privileges. In this period examples such as Taj Mahal, Katsura Imperia or the Versailles Palace were constructed, fanatically preserving the straight lines and a sacred symmetry. If prior in time gardens were an entity in landscape, in 17 century their significance shifted, becoming only extensions of the time's designs. Charbagh[4] best illustrates the divinity humans tried to wear to landscape, a demonstration first and foremost of their potency. On the other hand, 18th century was a century of historical events of great significance. Great philosophers such as Rosseau or Voltaire were key characters in the development of Enlightenment Age, which also coincides with the Revolution of Taste, occurring in England; product of which are the English Gardens. The formers were revolutionary themselves, for firstly embracing curved lines in design. According to the designers of the time a curved line allows connectivity and continuity, preserving an uncorrupted nature. English gardens aimed to conduct the ultimate sensation of pastoral aesthetics, ideology which was then adopted by American gardens and continues to be inspiring

[4] Persian and Indo-Persian quadrilateral garden layout based on the four gardens of Paradise.

even nowadays in parks, campuses, or other urban landscaping. Principles of framing, illusion, narration, variety, and observation dominantly constitute the design process of these gardens.

Still under the impact of the Industrial Revolution, the 19th century pioneered the concepts of time and space in design, an approach that furtherly softened the political power on design in general and was represented as Romanticism. Once again, the attention was shifted to natural phenomena and to the intricacy of natural beauty, believing it to be the supreme force towards spiritual uplifting. In order to improve the living standards of the mass emerging middle class, public parks were established, introducing landscape as an urban, public, and romantic discipline. This initiative among others, served a higher cause; it introduced people to the restorative impact of the landscape, and the great role it plays in their lives. 19th century is very important in landscape architecture history, for it first accepts landscape architecture as a distinct discipline and profession. "Landscape Architect" was a title first used professionally by Frederick Law Olmsted in the United States in 1863, after designing Central Park in New York City. Accessibility and identity were the main principles ruling the landscape design of the century.

Similar to the 18th century, the 20th century was an eventful period in history. Violent wars, mass migration, over-population, economic crises, and the formation of superpowers all impacted differently on landscape architecture. As America became a leading power in politics and economy, the landscape architecture profession also accelerated. Movements such as Country Place Era, City Beautiful, Modernism, and Postmodernism dictated the eras deigns in architecture and landscape architecture. In modernism analysis of site and the user's need decided upon the function and the form of a landscape, whereas in postmodernism, the aim was to reverse to a traditional sense of community. Grid was a main tool architects used in their design processes. On the other hand, 20th century landscape designs were influenced by artistic trends of the time, and various landscape arts of a large scale were created. It was the century where people for the first time started thinking intellectually about ecology and sustainability, terms that became a trend on the beginning of 21st

century. Designers and architects believed these terminologies would reshape the harmonic balance between humans and nature, and enormous landscape projects were designed bearing these principles. Some of these examples are: Herman Miller Factory Landscape, Georgia (2001)[5], Blur Building and Arteplage, Switzerland (2002)[6], Forum Esplanade, Spain (2004)[7], Shenyang Architectural University Campus, China (2004)[8], The living roof Academy of Scientists, California (2008)[9], designed by Renzo Piano. The concept of sustainability evolved each year, and new forms of approaching to it were introduced as new landscape projects continued to emerge. Designers and architects started to believe that the best way to preserve nature was to have a meticulous understanding of it, accept the intelligence and the history of a terrain, embrace its meaning so the implemented design to it should only enhance its characteristics. This approach was later defined with the term "landscape topology" by Christophe Girot in 2011. Landscape design defining nature should be replaced by nature defining landscape designs, a principle that researchers believe should be the future of landscape architecture, and topology should be a way of thinking while designing.

1.2 Topology in mathematics

Topology is considered to be one of the anchors of modern mathematics, along with algebra and analysis. In its beginnings, topology was cultivated by investigating real life problems, which later enhanced the abstract understanding of the term itself. In the past few years, scientists and researchers apply topology's concepts to better

[5] A rural factory, design of which was mostly driven by the hydrologic management of the site.
[6] A Project that blurs the lines between architecture and landscape, a formless and scaleless design that uses recycled and recyclable materials.
[7] A project that uses solar energy production as a space making device.
[8] Rice fields combined with native plantation, frame the outdoor spaces of the university.
[9] A project that efficiently mimics the iconic hills of San Francisco.

understand different fields such as economics, engineering, medicine, chemistry, design, and cosmology.

Topology is a term that has evolved from geometry. Its meaning derives from the prefix *"topos",* and the suffix "*logos",* of Greek origin, meaning the study of a location or position.[10] According to Collin Adams, a mathematician, "topology is the study of shapes, including their properties, deformations applied to them, mappings between them, and configurations composed to them."[11] If in traditional geometry objects are considered rigid, pertaining of well-defined distances between points and well-defined angles between edges, in topology objects are perceived of rubber, able to bent, twist, shrink, stretch or any other deformation of any form, without ripping apart. The objects that are the subjects of the study in topology are known as topological spaces, made up of sets of points, which depending on proximity, collect to create subsets, or also known as open sets in topological terminology.[12]



Figure 1.1: Möbius Strip

[10] Basics of Topology, *World Technologies*. 2014
[11] Collins Adams, Introduction to Topology: Pure and Applied. 2007
[12] Ibid.

A line, a circle, a sphere, and/or a plane can be topological space. Möbius Strip (see figure 1.1) is another geometric form, more complex, used to better understand and study topology. Its surface is formed by attaching the ends of a strip together with a half twist. These geometries are necessary to understand topological spaces and the open sets they define, their connections, intersections, and continuity, depending on various settings. Generally, topology is a study of continuity and connectivity mostly in abstract surfaces, which can also be understood in a way that encompasses a broader approach to the constructed reality.

1.2.1 The emergence of topology as a discipline

Topology first as a term coincidentally appears on a design problem, also known as the "famous Konigsberg bridges' problem, whose solution was presented in 1783 by Leonhard Euler.[13] The river Pregel used to divide the city of Konigsberg, in today's state of Russia, in four separate parts. The river was connected to the city by the means of seven different bridges. The citizens did wonder whether there was a way to stroll through the city while crossing each bridge only once.[14] This, being practically impossible, required for a new mathematical approach, being the "geometry of position"[15], assessed by Euler.

> *"Recently, there was announced a problem which while it certainly seemed to belong to geometry, was nevertheless so designed that it did not call for the determination of magnitude, nor could it be solved by quantitative calculation; consequently, I did not hesitate to assign it to the geometry of position, especially*

[13] Swiss mathematician and physicist, one of the founders of pure mathematics, father of the theory of topology, 17017-1783
[14] Collins Adams, Introduction to Topology: Pure and Applied, *Pearson Education.* 2007
[15] Type of mathematics, which according to Euler, did not address magnitude, as did traditional geometry

since the solution required only the consideration of position, calculation being of no use."[16]

After examining the problem, it was proved impossible to accomplish the aimed walk through the city, yet a deeper comprehension about relationships and connectivity in a geometrical field, depended on positions, thus proximity, was achieved. These approaches apply to other fields too, to understand problems and generate solutions; as in the case of landscape design, which is the main topic of this research.

1.3 Topology in Landscape

"Topology enables a more general understanding of landscape as a symbolic cultural entity, woven into physical and spatial relationships at the dimension of a territory."[17]

Mathematicians and researchers, started using the term "topology" for it conceives space and spatial relations mostly in terms of connective properties, less depended on distance and position. Ghristophe Girot, Annete Freytag, Albert Kirchengast, and Dunja Ritcher rediscovered the term in 2011, while researching "whether a simple term existed, which was capable of expressing both a poetic and constructive understanding of landscape."[18] The group of academics noticed how the term "tectonics" helped shaping a notation in the symbiotic relation of architectural design and construction, and drew an equity line with the term topology in landscape; for it 'could help define a structured sense of place and time.[19] Girot states that:

---

[16] Collins Adams, Introduction to Topology: Pure and Applied, *Pearson Education.* 2007
[17] Christophe Girot, Thinking the Contemporary Landscape, *Princeton Architectural Press*. 2016.
[18] Ibid. p.79
[19] Ibid. p.84

"*Topological thinking can help point towards a better assessment of place, and where design solutions may act upon the very substance and structure of the ground. By understanding terrain and surface conditions, we help modify the inherent significance of natural features as they interact with intent and purpose. Topology creates a particular intelligence of terrain by encompassing all matters of continuity and complexity through the simple recognition of landscape features embedded in the value of common ground."*

Through terms such as 'connectivity, network, assemblage, mobility, and, in particular relationality'[20], topology is an unfamiliar term but not perception among collective cognition. As Mitch Rose also explores, topology refers also to the way landscapes are assessed and shaped by societal and cultural necessities."[21] This thesis will also investigate the campus landscape as a successful example of complex coherence and continuity, its adaptive and restorative capabilities, altogether with the elements that facilitate it.

1.4 METU Campus Landscape

Designed in the 1960s by the architects Altug and Behruz Cinici, METU Campus is a pioneering establishment architecturally and intellectually in Turkey. Its exquisite modernist approach was a competitor of other iconic modernist buildings across the world. "With its highest ambition of design qualities in different scales, it was presented as a great example representing the "ideals of Modernity" in Turkish architecture.[22] The campus was designed to be a school of thought rather than just an educational institution. The planning of the campus was initiated with the idea to be a self-sufficient environment hosting all kinds of student facilities and a great

[20] Mitch Rose & John Wylie, Animating Landscape. *Environment and Planning D: Society and Space*. 2006
[21] Ibid. p.475
[22] Ayşen Savaş, "METU Campus", *Brownbook Magazine*, 2018.

landscape, which emerged together with the massive man-made forest of the campus. Its master plan, the individual architectural values of each building, their sublime communication using landscape as a medium, landscape itself with its all elements and structures, make up for the holistic design of the campus. Despite its meticulous planning, the cohesiveness and consistency in the campus is greatly complied by the forest, landscape, and its design. This research aims to lay detailed research on the landscape of the campus, starting from the afforestation process, up to small scale details of the landscape.

METU Campus becomes a unique case study first and foremost for its afforestation project. The territory in which the campus lays used to be a barren land, and now it is the largest green area in the city of Ankara, and one of the largest in Turkey. The forest as we see it today is a product of great effort and determination. Around 33 million trees are planted, part of which infuses into the main campus. The forest is an indispensable part of the landscape design for it contemplates and also rules the formation of outdoor spaces. A thorough research has not been made upon the designed landscape of the campus, even though its complexity and coherent functionality as a whole is very inspiring, and worth being analyzed.

1.5 Aims and Objectives

There has always been an interdependence among the components of a place, as is the case with a university campus, in which a plethora of interrelated variables is observable, making the campus a problem of organized complexity. Possessing the characteristics of a city itself, although fabricated and premeditated, the METU campus is endowed with four types of organized complexity, namely artefactual complexity, system complexity, biological complexity, and ecological complexity[23].

[23] Stephen Marshall, Planning, Design, and the Complexity of Cities. 2012

These types of complexity enable the identification of topological relations between the constituents of a university campus on various scales. At the core of landscape topology lies the idea that every component of a place, the ground, the objects, and the people are interrelated and connected in a cohesive and coherent way. The ever evolving and adapting landscape in integration with the buildings and other physical objects contributes to the richness of life within the campus. This integration acquires a profound meaning and topological thinking is utilized in assessing the quality of a place and especially in placemaking.[24]

Topological thinking serves as a framework for avoiding fragmentation, which characterizes, by and large, the results of contemporary design practices, empowered by the technological advancements. Having severe impacts on the quality of a place, the lack of cohesion between the constituents of a system, is a problem that needs to be approached through topological thinking. The main objective of this research is to explore how the built environment integrates with the landscape in terms of topology and how the combination of these two facilitates uses, activities, and movements from the perspective of experience. In this context this thesis focuses on identifying how the METU Campus provides a model for exploring landscape topology. The METU Campus embodies a topological intelligence from which certain rules of generating connectedness between physical elements of a place can be selected. As such, elements and patterns indicating successful topological relations will be extracted from the environment of the METU campus.

1.5.1 Methodology Research and Hypothesis

To address the main question of this research, a topological perspective of the university campus is explained, and the relevant definitions are established. The

[24] Nesli Naz Aksu, Topological Ground: Land Form and Built Form, *unpublished PhD thesis, METU.* 2022.

main hypothesis of the research is that the METU Campus is a successful topological ground and embodies elements and patterns of interrelated cohesiveness among its physical components. The landscape and the buildings are not separate but blended and maintain a symbiotic relationship which contributes to the harmonious life within the campus. Each and every built object respects the original physical attributes of the land as nature itself embraces them in its continuous adaptation.

This explorative research will analyze the topological ground of the METU campus through visualization and as a result will create an inventory for how a topological thinking can be applied in place making. It is the duty of every designer to premeditate the final state of their creation. However, one should not forget to leave room for change and adaptation. The METU Campus is an exemplary of such a creation, where although every object is planned and designed, the system as a whole is evolving in a cohesive manner. To generate an insight on how many more successful examples of topological landscapes can be created in future developments patterns of topological relations will be documented and categorized with respect to the activities and experiences they instigate. This inventory will help introduce topological thinking in places devoid of it, generate it from scratch where new objects are being built or reintroduce it in spaces that make no place.

1.5.2 Outline of the thesis

This thesis introduces five chapters to elaborate the research made upon the METU Campus landscape and its functioning as a topological ground. First chapter consists of the introduction of the topic together with a brief history of landscape design's evolution as a distinct discipline. It continues by exploring the main principles of topology and how it emerged as a term in science. Aims and objectives, methodology research and hypothesis summarize this chapter. Second chapter follows the first one by digging deeper into topology and its relation to landscape design, while chapter three concentrates on the METU Campus, its afforestation project and the landscape that emerges from it. The fourth topic unfolds the campus as a topological ground,

focusing on the relations between different elements of it and the complexity they disperse while preserving a coherent and a cohesive environment. The last chapter, being the fifth one, concludes the research in a summary form.

CHAPTER 2

TOPOLOGY IN LANDSCAPE

This chapter focuses on explaining the term 'topology' as related to landscape architecture, for the term beforehand is vastly known for its mathematical and philosophical connotation. The first heading will contain a brief introduction to the term in general, whereas the second one will elaborate further on the academic research of topology in the landscape.

2.1 The topological thinking

Topology is a concept vastly used in philosophy too, which gives space for the term to be adapted in many other fields. Anthropologists for instance, have used topology to search for patterns and internal relations to dynamize the concerns of relation, continuity, and change. Edmund R. Leach (1961) used topology as a medium to elucidate the flexibility of networks of relations, while analyzing societies as "assemblages of variables". Topology was used as tool to facilitate specific organizations of logics, of "parts and wholes, insides and outsides, continuity and discontinuity, the totality and system, among a host of other themes."[25] Later on research and academic developments engaged topology as a conceptual framework to better fathom dynamicity, intensity, and transformation as other logics of relations of a structure. While researches such Marilyn Strathern (1991) and Bruno Latour (2005) operated on fractals and networks to understand relationality and continuity,

[25] Gros, Russell, Stafford, Introduction: Topology as Method. *"Theorizing the Contemporary"*, 2019.

Gillez Deleuze (2004), made use of topology on his delineation of structuralism, focusing on the structured character of transformability through the concept of *spatium*. Others have introduced topology as a social frame to depict multiplicity and hybridity of spatial forms. The common ground where all the theories about topology met it's the logic behind it: giving life to a way of thinking that does not restrict one's understandings or knowledge on pre-defined and frame of reference and relations. The things, their roles and relations can anytime be reconsidered in accordance with different conceptions of space.

2.1.1 Topology in/and Landscape

"Topology enables a more general understanding of landscape as a symbolic cultural entity, woven into physical and spatial relationships at the dimension of a territory."[26]

As previously mentioned in this thesis, architects and academics chose the term "topology" for it conceives space and spatial relations mostly in terms of connective properties rather than distance and position. The term was rediscovered in 2011, while Ghristophe Girot, Annete Freytag, Albert Kirchengast, and Dunja Ritcher were researching "whether a simple term existed, which was capable of expressing both a poetic and constructive understanding of landscape."[27] The group of researchers noticed that the term topology could help define a structured sense of place and time and return to a more original intelligence of terrain'.[28]

At a pace in which the overpopulation of the planet seems to be less likely manageable, the repercussions of its consequences in the cultural and biological

---

[26] Girot, C., & Imhof, D. Thinking the Contemporary Landscape (Illustrated ed.). *Princeton Architectural Press*. 2016
[27] Ibid, p.79
[28] Ibid. p.84

diversity are deteriorating into irreversibility. Topology, Girot believes, is the approach that will push landscape architects to think and design unconventionally, reinvent the nature to respond to its users and the challenges of the ground. To be able to approach to landscaping and design as mentioned, one is required to have a deep understanding of ecology and diversity, thorough information about the ground and its potential.

2.2 A Topological Approach

Not only does topology control the shaping of a landscape; it does so by intuitively understanding the landscapes' adaptive potential. Similarly, Freytag, in her "Topology and Phenomenology in Landscape Architecture" book, notes that the goal of establishing a "topological thinking" is to 'merge ecological concerns and a design approach that considers the basic factors of modelling a site: the understanding of both the terrain and the history of a place, its spatial qualities, the condition of its soil, the proper use of plants, building materials, and the adjustment to the expectations of its users while challenging aesthetic sensitivities'.[29] Girot and Freytag are two of the most important names in academy who are thoroughly studying the landscape topology. They have similar opinions in what topology represents and stands for as a term and do have great enthusiasm for the modern landscape designing to follow a topological approach. The most important value of the topological approach in landscape design is that it can represent a fundamentally new type of process, allowing a great interaction between disciplines such as architecture, engineering, environmental sciences, hydrology, planning and agriculture. In this manner, Girot states, future landscapes will be prototyped, simulated, and tested by other fields of competence in a series of feedback loops. Accordingly, topological design must be a meticulously well thought, conscious and

[29] Anette Freytag, Topology and Phenomenology in Landscape Architecture. 2018

visionary process. In the book "Topology: Topical Thoughts on Contemporary Landscape", both the above-mentioned authors, Girot and Freytag explore how landscape architecture is more meaningful when its design is based in technical, cultural, societal, and symbolic aspects of the terrain (p.92). The typical design approaches, they claim, favor image and programme over the understanding of the site. Typology intends to reverse the former conception and prioritize site-based information in landscape architecture. Girot is of the thought that the emergence of perspective in representation techniques, and of landscape as an autonomous discipline, comes along with deprivation from healthy built environments. "The discrepancy between a perspective image and a site as a whole tends to cripple our apprehension of the world."[30]Analogically, images in perspective and other idealized representations, which are among the crucial mediators between humans and environment, introduce fake expectations and weakens the possibility to acknowledge the full potential of a site. Similarly, prioritizing programme over a sites' peculiar intricacies, might cause an atrophy in meaning, for the site loses its significance; transforming into a white canvas for the architect to pour the envisioned design. Such practices, apart from being far from ideologically correct, often times come with grand costly out-turns. In the before mentioned book 'The parc de la Villete' is used to illustrate such approaches questioning whether it could have been different. It is easily fathomed how the former and other similar deigns lack the obvious understanding of the aesthetic theory on site topology and its setting. For these and similar reasons, prominent names in the field of landscape architecture, strongly suggest that one should embrace a topological approach when it comes to designing, for the topology is a common ground that unites the terrain intelligence, its aesthetics and most importantly creates space to envision a landscape's adaptive capacity.

[30] Anette Freytag, Topology: Topical Thoughts on Contemporary Landscape, p.104

2.2.1 Topology, the future of design

"Topology delivers clear and simple solutions to very complex problems, by making the obvious physical choices pertaining to a site knowingly."[31]

In his other essay "Immanent Landscapes", Girot proposes that landscapes should be able to change, adapt and be shaped by humans into a 'lasting whole, acquiring deeper form and symbolic congruence as a result of its travails'.[32] This might be what shifts the viewpoints in how landscapes should be preserved and inherited. Sometimes the best inherited quality of a landscape is the extraordinary human scene that might thrive around it. It possesses the power to encourage all the five senses in humans, engage them to physical activity or introduce them to a deep serenity; offering a *locus aemonius*, where one captures a moment of immanent harmony with nature. Proceeding with today's impeccable technological advance, Girot suggests that it is possible to create places of great potential aided by cybernetics and modeling.

"The Romans believed in three kinds of nature: an untouched wilderness, productive agriculture, and the garden as cultural and symbolic artifact. Today, only one kind of nature remains where humankind dominates, seeking to show both a mastery over, and an understanding of, the processes of natural creation. This scientific approach to nature is monitored, programmed, fabricated, and maintained through empirical methods of trial and error with the help of advanced cybernetics and modeling."[33]

---

[31] Ibid. p.92
[32] Christophe Girot, Immanent Landscapes. *Critique d'art*. 2018
[33] Christophe Girot, Topology and Landscape Experimentation

Girot promotes 'Point Cloud Modeling'[34] as a way to precisely and meticulously model any terrain to be designed. He is supportive of the idea that if one gets to have a perfect three-dimensional model, the easier it gets to understand a terrain and to premediate better designs.

Due to this system's accuracy to a high percentage in modelling, the process of construction is facilitated at a great scale also, as per each possible unpredictable factor has been beforehand noticed and introduced a solution. This approach, as Girot states, might be the way for designers to reconnect with the terrain, to fathom its knowledge and generate better landscapes and architecture. As previously mentioned, climate changes and various similar phenomena are a menace for the planet.

> *"Landscape architect will be asked to reinvent forms of nature that respond appropriately to the unwieldy challenges of ground conditions linked to climate change and other human-induced nuisances such as noise and pollution."*[35]

What Girot suggests is that by the means of topology the newly designed landscapes if not able to fight overpopulation, climate change or pollution, at least these factors will be taken in consideration while designing. Factors of such danger scale, which should have been taken in consideration long before, should now be an inseparable part of conscience while designing. If not able to make the planet a better place for the upcoming generations, it is one duty as an architect or landscape architect to preserve what already there is. Shifting towards topological thinking is an important step to reevaluating of the ground, its values and importance.

---

[34] A 3D scanning process: a 3D point cloud can then convert into a 3D mesh in a modelling software, and the resulting model can be used in CAD programs as well as in BIM ones

[35] Girot, Landscape Topology FS 2016 V05

CHAPTER 3

METU CAMPUS: AN IDEAL LANDSCAPE[36]

This chapter will explore METU Campus Forest and its landscape design as an emergent of it, in terms of it being a successful example of topological design. All the elements that contribute to its topological formation will be illustrated and analyzed aesthetically and functionally.

3.1 METU Landscape: It all started with a dream

The first tree to have been planted on METU Campus dates back on the 3rd of December 1961.[37] The former rector of the university, Kemal Kurdas, together with the first batch of students attending the university, took the incentive of transforming a barren land into Ankara's largest forest. The afforestation of 4500 hectares started with the first pine tree planted, as the students of that time claim, at the main entrance of the campus, on the hill on the right side. The planting process then continued towards Eymir Lake, proceeding to the area of the main campus today. The aim was to plant 15 million trees, whereas today, the number exceeds 30 million trees on the whole campus. The planting campaign and planning itself started in 1959, the first tree was planted, as mentioned above, in 1961, continuing at a pace of several hundred thousand trees per year and spreading tons of seeds to generate greenery in the driest steps of Central Anatolia. Between 1961 and 1992, nearly nine million conifers and over 22 million deciduous were planted.[38] As explained in various reports, to ease the whole process of the plantation, two landscaping centers were

[36] Used by Savaş, A & Sargın, A., G., in "A university is a society"
[37] Aysil Yavuz., Landscaping of the METU Campus, *local report*. (n.d.).
[38] Ibid.

established. One of them being in Yalincak and the second one further in the northwest (see figure 3.2). Seedlings were planted in plastic bags filled with earth and would remain in Yalincak Centre for three years for then to be transferred to the second center, where the necessary filtration for the selection of the healthiest specimens was made. This center itself could prepare up to forty thousand saplings each spring, whereas the Ministry of Forestry would also provide another forty thousand trees per year, free of cost. The re-Forestation Programme of METU Report states the afforestation of non-irrigational plantings covers 3,100 hectares. As rainfall is scarce in the area, terraces following the contours of the hills were built to help preserve surface water.



Figure 3.1: A part of METU Forest as seen from the main library

Plants that require irrigation cover only 800 hectares of the vast site and basically consist of a landscaped pedestrian network within the grounds of the university. The remaining 500 hectares of the campus comprise lakes and ponds, a very important part of the campus' ecosystem. According to Kemal Kurdas, this project was a novel forestation exercise, a pioneer of its kind. The process of afforestation and landscaping of the campus was under the technical guidance of Dr. Alaaddin Egemen, a successful landscape architect of the time, who carefully and exquisitely selected each specie planted in reference to the soil potential and climatic conditions. By 1960 with the help of the university's department of landscaping, various tree species were tested in order to decide what was appropriate. Nevertheless, the architect made sure to preserve the poetic sensitivity of the project over technology, characteristic which once again makes ODTU Campus Landscaping different from similar projects. METU was the first campus that has grown with and within a man-made forest, with all the poetic connotations ensue.[39]

The METU Forest is one of the very limited areas in Ankara that could harbor natural life.[40] The Lake Eymir, on the other hand, plays a crucial role in this ecosystem and in the welfare of METU nature. On October 1, 1963, the new METU Campus opened its gates to education. It was the same year that the Tree Planting Festival started taking place at Eymir Lake. On the website of METU Directorate of Afforestation and Landscaping, the development of METU Forest is recounted as follows: "Since 1961 up until today, around 10 million coniferous trees and 23 million broad-leaved trees resistant to dry weather conditions such as black pines (which alone covers 1650 hectare), yellow pines, taurus cedars, oaks, poplars, prunus mahllep and almond trees have been planted in our campus".[41] As mentioned in one of the reports of Landscaping of the METU Campus in 1995, the campus also hosts an orchard where

[39] Re-Forestation Programme of the Middle East Technical University. (n.d.).
[40] Ibid.
[41] Ibid.

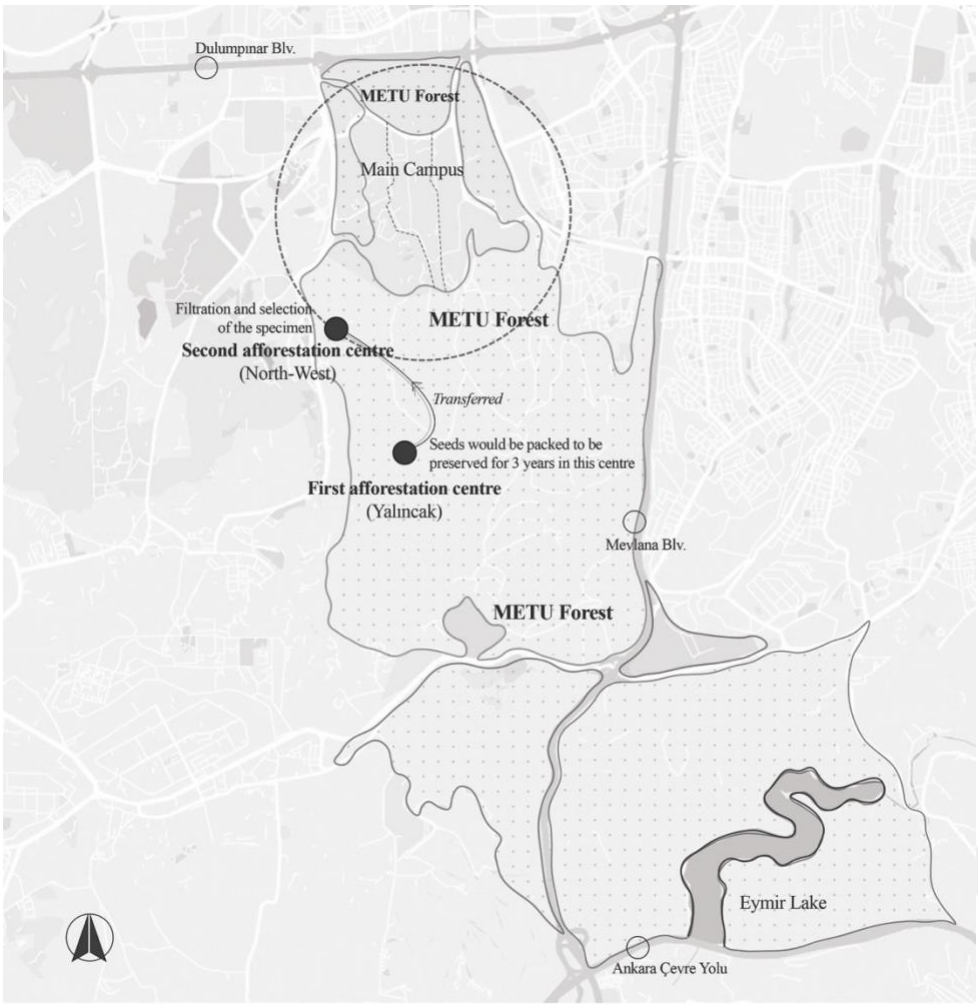


Figure 3.2: The two centers working on the afforestation project, mapped by the author

4,500 morello cherry, pear, and apple trees grow. The Ministry of Culture of the Republic of Turkey declared the METU Forest, which covers around 100-hectare area, a Natural and Archeological Protected Area in 1995.[42] On a booklet published on the occasion of the 10th anniversary of the university, Ankara's correspondent of the Times at the same year quotes: "one of the most important aspects of the

[42] Directorate of Forestation and Landscaping, "Forest Maintenance and Afforestation Works."

university is its encouragement of forestry. The Middle East, as a region, is almost barren of trees and one of the worst disasters suffered by the Anatolian plateau over centuries, is the disappearance of its great forests of the past, mostly under the woodcutter's axe and through the depredation of voracious goats."[43] The afforestation project was of great importance for the rector of the time. In his book "ODTU Yıllarım: Bir hizmet hikayesi", he explains how the first half of the project was an experimental period of initial establishment, while the second half became an era of dynamic creativeness. This whole process of trial and success transformed vast wheat fields into what we see today: an infinite greenery that holistically embraces more than 50 modern buildings, laboratories, libraries, and various student facilities.

3.1.1 Afforestation of METU Campus

The METU Campus is the largest green space in Ankara today. The METU Afforestation Project was awarded the International Aga Khan Architecture Prize in "innovative concepts" category in 1995 and was deemed worthy of an award by the TEMA Foundation in 2003 "for its support for turning an arid land into a green area and contributing to the struggle against desertification".[44] METU Forest harbors a very rich flora and fauna that normally is facing danger of extinction in Central Anatolia. A series of wild animals such as wolves, foxes, reptiles, partridges, rabbits, snakes, and tortoises as well as several mammals and reptiles together with over 140 bird species and fish live in the forest, lake and ponds. Another very important feature of the afforestation of the campus is that other types of trees, shrubs and shrubs specific to the steppe were used instead of traditionally using only pine and other conifers. During those years, not only in Turkey but also worldwide, in the forestation projects the first aspect considered was the economical one, that is why

[43] Aysil Yavuz, Landscaping of the METU Campus, local report. (n.d.).
[44] *METU Forest*. (2019). 60 Years. http://60yil.metu.edu.tr/odtu-ormani

these activities generally consist of mainly one type of tree (usually pine). The afforestation works, which are not carried out with a single species of plant and are in accordance with nature, are called green desserts in terms of ecology. This afforestation approach, being the one more ecologically correct, was firstly applied in METU and started to spread only after 1980s and still there are very few examples in Turkey. In the plantation of METU Forest several other plant species are found such as: ground covering loses, jasmines in the form of shrubs, rosehips, wild yellow roses, cerise, hawthorns etc. Trees such as nuts, almonds and mahalebs, which are very important for the endurance of wildlife, were also planted. This was a very innovative afforestation method for the time. The following pictures depict the first steps into afforestation of the campus, and some events form Tree Planting Festival (figure 3.3).

The site plan of METU was introduced in the 1965-1966 General Catalogue, and it depicted the initial concept of how the campus should look like. There were no clearing made in the forest; rather, the restored forest created a clearing for the campus, and thus intensified its impact.[45] This process turns to be more than just an afforestation project. The selected plantation lives and develops in harmony with the designed buildings and other spaces, creating distinctive and unforgettable experiences. The forest itself is the seed, from which flourished the landscaping of the campus. The landscaping intertwined with the forest is not a recreational or open area; it does instead define the recreational and open areas. The attempt to bring a forest to life apart from its ecological and recreational values, was also a mean to create a physical boundary for the newly established university. The forest hosts the campus and its landscaping while protectively but sublimely gating it from the rest of the city.

[45] Re-Forestation Programme of the Middle East Technical University. (n.d.).

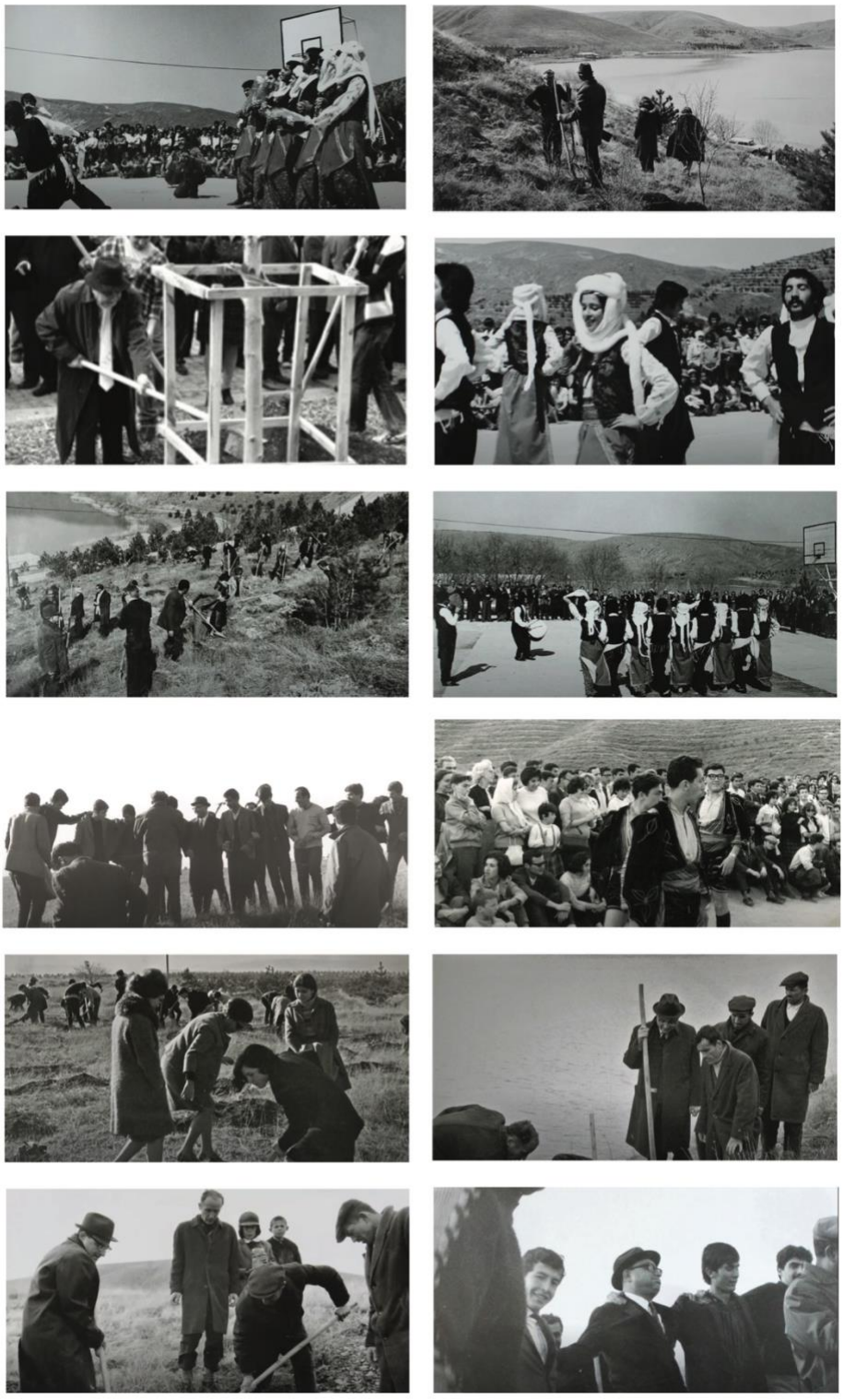


Figure 3.3: Tree Planting Festival, organized each academic year



Figure 3.4: METU Campus before afforestation

3.2 Landscapes of Change

The word “landscape” originates around the turn of the sixteenth century in England and was used to describe small Dutch panel paintings of rural scenery. Fernando Pessosa says in the “Book of Disquiet” that the landscape, admirable as a picture, rarely makes a comfortable bed (Pessosa,1982). Being distant and comfortable, all at once, the in-between tensions created by such warring forces are what shape the

cogency of a landscape. The two opposing currents causing this whirlpool of tensions are as simple as presence and absence. To perform, create and perceive presence even if absent is essential for the creation of these tensions. A harmonious emergence and intertwining of presence and absence is what makes a good landscape.

Altug and Behruz Cinici's plan for the campus revealed holistic, sensitive, and detailed approaches to the landscaping of the campus and the construction of open spaces.[46] In one of the first planning reports, written by the architects themselves, principles of landscape, space design, and the creation of presence and absence are very decisive in the planning and architectural design of the campus. "The art of creating spaces between buildings seems to be lost nowadays. We see the building as a physical shape whose inner volume is of use. The "Outdoor Space" this volume establishes with other masses around is generally a neglected issue. I wanted to do this in campus: I saw a physical shape in these empty spaces and tried to give them the tensions, the volumetric connections, and the light patterns of the interior spaces."[47]

To be able to start analyzing the landscape, one must first acknowledge that it is a distinctive spatial categorization in geography. While at first, it defines a specific environment, furtherly, it represents "the appearance of a land, as we perceive it".[48] In terms of its appearance, the landscape can be conceptualized as an object, while its physical presence is an environment. J.B. Jackson, in his "Discovering the Vernacular Landscape" book, claims that landscape is a portion of the earth's surface that can be comprehended at a glance (1984, p.3); whereas Lewis elaborates that landscape is our unwitting autobiography that reflects our tastes, values, aspirations,

---

[46] Re-forestation of METU Campus, Report

[47] Directorate of Forestation and Landscaping, "Forest Maintenance and Afforestation Works."

[48] Hartshorne, R. (1961). *The Nature of Geography*. https://doi.org/10.1604/9780892910878

and even fears, in a tangible and visible form (1979, p.12). Tuan, on the other hand, in his "Landscapes of fear" book, describes how the landscape appears to us through an effort of the imagination exercised over sense data (1979, p.90), while Cosgrove in "Social Formation and Symbolic Landscape" is of the thought that landscape is a way of seeing, a composition and structuring of the world so it might be appropriated by a detached, individual spectator to whom an illusion of order and control is offered through the composition of space (1985, p.55). In all the above definitions, the transition from the material to the aesthetic is very smooth.

METU Campus' Landscape is both, the unified impression of an area and all the separate entities that create that impression. Zooming out to marking the biggest green area in the midst of the greyish soul of Ankara, to downscaling to every well thought and designed detail of its landscape, the campus can easily be fathomed at a glance. It is at the same time an autobiography, a documentation of a higher aspiration for change, "an indicative of the Turkish Republic's desire for modernization in all of its social and ideological programs".[49] As Tuan in his "Thought and Landscape" book, is of the opinion that "Yearning for an ideal and humane habitat is perhaps universal", the campus landscape itself encourages one to dream the future while seeing, touching, and walking through the present, meaningfully shaped by the past. Wandering in the Landscape of METU Campus, one gets to recognize not only the intricacies and diversities of human conduct but also the level of complexity and anticipation that is needed to achieve a habitat to keep up with the full potential of our being. Such a habitat must be of great importance and possess a direct material effect on our lives. As Schein states: "If it is accepted… that landscape matters – then it is necessary to ask how it matters".[50]

---

[49] Sargın, G. A., & Savaş, A. (2016). 'A University is a society': an environmental history of the METU 'campus.' *The Journal of Architecture*, *21*(4), 602–629. https://doi.org/10.1080/13602365.2016.1192429

[50] Richard R. Schein, The place of landscape: A concptual framework for interpreting an American scene. 2004



Figure 3.5: Landscapes of the Campus

In other words, the landscape's material impact on our lives is deeply connected to how the landscape comes to have a great significance within a wider network of meanings and relations.



Figure 3.6: Habitats shaped by Campus' Landscape

Landscape becomes a physical entity and ensures its endurance depending in what it initiates, provides, activates, and inspires. METU Campus' Landscape self-preserves and enhances its being by offering comfort, diversity, freedom, and privacy. It is sustained through the continuous practices and activities that surround it, whose repetition through generations has created an imprint, able to keep inheriting while evolving itself through the years (see figure 3.6). The sublimity of the landscape of the campus lies in between its ability to adapt to each habitant's need and its power to maintain the ethos of its own. Its identity carries pieces of information from each inhabitant or passerby.

"We travel for various purposes; to explore the culture of soils; to view the curiosities of art; to survey the beauties of nature; to search for her productions; and learn the manners of men; their different polities and modes of life."[51]

The over-the-years smoothed pavements, aesthetically cracked corners of urban furniture, stairs and ramps that conceal innumerous steps, and same trees that have had the back of resting students for generations; all make up for the mysticality that the campus landscape unfolds. In other words, everyone who has experienced the landscape of the campus has never been a mere passive observer of the scenery, rather than an active potency in its formation as landscape. In a similar paradigm, Vittoria Di Palma, in her essay "In the Mood for Landscape", expresses that landscape suggests an impassioned engagement that creates mental states, types of response, varieties of emotion, and patterns of interaction.[52] In such a case, one cannot help but wonder whether the landscape is able to shape or change one's behavioral patterns, routines, or even one's subjects of interest. METU campus' in its core, is a temple of change. It endorses one with a new ideology about life, expectations, and the will to reach for the best. The institution itself is a school of thought, despite its academic values. The history of its establishment and the effort put to attain a foundation able to make a difference in a whole country, imposes one to improve and intellectually feed oneself, as the campus itself is the raw example of how the power of thought can change a whole society. Amidst all the novelties that the university brought to life, its afforestation was one of a great scale. The process of successfully achieving such a project and envisioning the METU Campus' Landscape as seen today, went a long way from the first years up until now. It was a decision made from a pure visionary approach of the rector of the time, Kemal

---

[51] William Gilpin, Observations on the River Wye, *1782 (Revolution and Romanticism, 1789–1834)*. 1991. (Facsim.of 1782 Ed). Pubs Distribution Center.

[52] Christophe Girot, Thinking the Contemporary Landscape, *Critique d'art*. 2018. https://doi.org/10.4000/critiquedart.25605

Kurdas, assisted by the architects Altug and Behruz Cinici, together with the technical guidance of the landscape architect Alaadin Egemen. The first thought implementations about the afforestation of the campus started between 1958 and 1960, when a classification map of the campus land was prepared. The map indicated that 75% of the university land should be cultivated by general landscaping to prevent erosion (see figure 3.7).[53] Another incentive that led to the afforestation of a zone considerably close to Ankara was the provision by Turkish law that 'forest land could not be expropriated', thereby precluding future urban sprawl. Amidst many other missions, this project took upon, was to change the conventional thinking of greening a city by mere neighborhood parks or similar other open spaces.



Figure 3.7: Map about the forestation of the campus, 1958

[53] *Re-Forestation Programme of the Middle East Technical University*. (n.d.).

The below pictures give an immediate grasp in chronological order of the before and after afforestation on the campus. The first picture of Figure 3.8 captures the Faculty of Architecture in 1960. Second picture depicts the same faculty, few years apart, after the plantation had started. Last picture is an aerial photo focusing on the building of cafeteria, 30 years apart from the first one.



Figure 3.8: Afforestation Process of the Campus

3.3 The formation of a Topological Ground

The first instant one has a look at the site plan of METU Campus (figure 3.9), cannot help but be impressed by the complex simplicity it manages to assemblage. “The university was designed as a total entity, a three-dimensional modern grid spread over the barren Anatolian prairie.”[54] The grid helps the well thought distribution of the three main zones of the university, which are arranged according to their function: Academic Zone, Academic Centre, and Non-Academic Zone. The Academic Zone horizontally stretches itself on the hill on the right side of the entrance road bordered by the Alley. It hosts the faculty budlings which are locationally opposed by the Administration Building, Central Library, and Main Auditorium. The formers make up for the Academic Center of the campus, bordered by the Alley and the main road.[55] These two zones are embraced by the third one, the Non-Academic Zone, consisting of student dormitories, teaching staff residencies and various facility buildings; all of three zones being beautifully interconnected by the landscape of the campus which introduces itself as serene yet holds an opulent identity.

The above-mentioned architectural site plan does not fail to impress once routing around the campus (see the master plan on figure 3.9). The *well-preserved topography*, creating level differences to allow attractive vistas while evoking mystery for what hides beyond, is one of the most crucial design schemes to create a *rhythmic and harmonic organization of spaces*. The *spatial connection between the alley and the buildings* seems to take place so naturally; each building is fly unified with the alley. The *placement of artworks* around the campus can easily draw

---

[54] Ayşen Savas & Güven Arif Sargın, ‘A University is a society’: an environmental history of the METU ‘campus.’ *The Journal of Architecture*. 2016. https://doi.org/10.1080/13602365.2016.1192429

[55] Ayşen Savaş, “Three Modern Campuses, Three Revolutions, Three Experiments” *OverHoland* 2022 (in the process of publication)

attention - for each of them carries historic and high artistic and design values – same as the *in-site built urban furniture* that holds no less of a worth.



Figure 3.9: Site plan of the METU Campus

Various architectural structures and façade elements of the campus playfully *interact with greenery and even sunlight*. Seasonal blossoming of various trees achieves to temporarily hinder the brutalist modernist architectural approach on the campus. The voyage around the campus can feed ones' eyes with great architecture, and peaceful landscape, until you come across your possible reflection on the *water elements*, that lie unbothered beside the buildings and among the greenery. The scrupulous *choice of plants and trees,* their *placement and distancing* play a crucial role in creating meaningful outdoor spaces around the campus. They generate shade, depth, comfort, privacy, and most importantly collective areas, transforming various spaces of the landscape into landmarks. Such examples are displayed on Figure 3.10,

where trees and greenery are the key factors for the creation of similar collective areas.



Figure 3.10: Various sceneries in the campus

The novelty and the significance of such spaces in one's everyday practices translates on individual perceptions of what the term landscape represents.

> *"Why is it, I wonder, that we have trouble agreeing on the meaning of landscape? The word is simple enough, and it refers to something which we think we understand; and yet to each of us it seems to mean something different."*[56]

All of the above contribute to the sophisticated scenography that the landscape of the campus introduces. They shape networks of interconnectedness, connections and interactions, that translate into layers of meaning, memory and aesthetic values. These elements are the ground for the campus's formation as a topologic landscape. How these elements relate and communicate to on another will be studied in the further chapters of this research.

---

[56] *Discovering the Vernacular Landscape by John Brinckerhoff Jackson (1984–07-01)*. (1785). Yale University Press.



Figure 3.11: The area between the rectorate building and the cafeteria.

The most important component of a topological design, according to Girot, is connectivity. How the above elements collaborate with each other, their communication and the fuse with the overall design are what generate the topology of a ground. The convergence of the sequences of a designed landscape space relies tightly to a well-planned and an envisioned program and architecture. A healthy communication of the nature as part of a landscape design with all its constructed elements requires a deep understanding at first of its terrain, as being the base for the imminent actions of design. Topology, proposes Girot, is the magnet that brings all the pieces together, in a world where things tend to become rather deconstructed and scattered or fragmented. A designer or a landscape architect should aim for a common ground, that acquires, and adapts towards its inhabitants needs, rather than dictating or suppressing them; it should augment one's story of everyday practices. Design is humanistic, and in some cases even political, but fundamentally is a narrative act. "With each design decision the landscape architect engages the narratives that live in a site."[57] Consequently one engages in the story; crafting a role as spatial and relational thinker, responsible to listen and understand the socio-political narratives that shape our environments. "At a time when so many scales of conflict from climate change to segregation, to police brutality, are tied to systems of spatial organization, the landscape embodies our many legacies, and landscape architecture becomes a key tool for advocacy and action."[58] Topology, in essence is the "refined art of picking out the crucial features of a site; the approach to it must be local, precise, and culturally specific."[59] The landscape architect thus, should and ought to be intensely connected and involved with the story and the identity intended to the landscape. The most crucial criteria a landscape shall fulfill is the inducement of a meaningful engagement of the individuals with the place. As Azurra Cox elaborates, "for when we design, we not only reveal histories, but ignite futures, since

[57] Azurra Cox, Landscape of Belonging: Grounding Memory, Sowing Futures.
[58] Ibid.
[59] Cristophe Girot, The Elegance of Topology, Landscipt 03: Topology, p.82

spatial quality does engender new forms of interaction". One should be able to create an intimate bond with landscape, to evoke the feeling of belongingness. Joseph Margolis, an American philosopher, supports the idea that the feeling of belongingness blossoms if one cooperates and/or partakes in the shaping, not necessarily physical, of a certain environment. That is why Robert Smithson while observing Olmsted's works, concludes that the most powerful landscape projects are never finished; they remain carriers of the unexpected and of contradiction on all levels of human activity.[60] A designed landscape should be able to create space for one to integrate, and evoke practices that enhance the desire to connect to nature. An ultimate connection between humans and landscapes is reached when a third medium, which is the spirit of a place, predominates in the recognition and the definition of that space. Topological approach in landscape design aims to restitute a particular sense of continuity on the ground; cognitive as well as physical, for humans find comfort in the concept of continuity itself. Topology as a concept, is first mentioned in the field of mathematics, referring to the science that studies continual surfaces, how spaces are organized and how they are structured in terms of position. The aim of this study is also to analyze the METU Campus as a topological ground regarding the above-mentioned physical qualities, bearing in mind its socio-political values as well. In this chapter, the campus will be investigated as a space of complex continuity and connectivity, by researching all the components that contribute to such a formation. The components providing the complexity of spatial and cognitive continuity while maintaining coherence vary in different scales. They can be grouped as:

1. The Grid
2. The network: Landscape, Architecture and User Interaction
3. Activity Layout

[60] Robert Smithson, Landscape Theory: Talking about Landscapes

3.4 A Gated Landscape

The forest of the campus was breaking a new ground not only in that it was different ecologically but also in its intentions on functioning. The forest was not planned to be accessible by none but the students of the university. Together with the main campus's territory and plantation, the forest gives life to a new concept in Turkey, being a gated landscape. Gated landscapes have existed to be correct, but in very smaller scales, see for example Pio Pico's State Park (PPSP). It is uncommon for a landscape of urban scale to be gated. Landscape, etymologically speaking, signifies a defined or a delimited area of territory.[61] J.B Jackson explores the meaning of the landscape etymologically, starting from the Dutch word *landskip*, which derives from the joining of the prefix "land" – that stands for the matter making up the surface of the earth; and the suffix "scape" – a German term that is used to dictate a bounded entity.

METU Campus brings to life a new practice; physical as well as cognitive and intellectual. A gated landscape in itself forms a new ground; the term ground here can be used both physically as in the meaning of a land/territory and/or a foundation of a new way of thinking. Considering the fact that this urban landscape offered a vision not similar to the models and examples already existing, it is necessary to understand its physicality, connectiveness, interrelations, and its mediators of cohesion that present METU Campus' Landscape as a whole. A wholeness is at essence actually a composition; and architect/landscape architect must deal with the variety of the elements and programs to keep up with the expectations of the new society. As Rafael Moneo states in his writing "On Topology", a theory of composition is needed to provide an instrument capable of coping with a diversity that, with difficulty, can be reduced to known types.[62] To have a better glimpse on

[61] J.B Jackson, The Word itself: *A Sense of Time a Sense of Place.*
[62] Topology. (1980). *Topology*, *19*(1), 99. https://doi.org/10.1016/0040-9383(80)90035-x

the diversity and complexity of the campus and its forest, it is important to pin out some elements of the campus landscape that compose its physicality as a whole.

> *"When a poet's mind is perfectly equipped for his work, it is constantly amalgamating disparate experiences; the ordinary man's experience is chaotic, irregular, fragmentary. The latter falls in love, or reads Spinoza, and these two experiences have nothing to do with each other, or with the noise of the typewriter or the smell of cooking; in the mind of the poet these experiences are always forming new wholes."*[63]

Eliot is trying to make a point of how an ordinary individual's mind works on perceiving and interpreting images, for they are all poets in varying degrees. As Yi-Fu Tuan in his "Thought and Landscape" book quotes "when we look at a landscape, our eyes have automatically combined visual data to form a stereoscopic image, and our mind has integrated, with little conscious effort, diverse clues, and experiences to give rich meaning to that image.[64] What he implies is that to see landscape properly, different sets of data must be interfused together through an imaginative effort. But can the eye of a layman properly discern the wholeness of a landscape?

To be able to discern the wholeness of the landscape of METU Campus, this research investigates thoroughly all its elements, and how they connect and form a topological ground. To do so, it is necessary to define the campus of the university by starting to analyze how it becomes a separate entity from the rest of the city. The upcoming heading narrates how the campus is a gated landscape and touch upon crucial architectural details of the gates themselves.

---

[63] Eliot, T. S. (2022). *Selected Essays of T.S. Eliot (New Edition)* (1st ed.). Harcourt, Brace & Co.

[64] Seamon, D. (2014). "Romantic Geography: In Search of the Sublime Landscape" by Yi-Fu Tuan. *Environmental Philosophy*, *11*(2), 369–372. https://doi.org/10.5840/envirophil201411213

3.4.1 Gates

Most of METU Campus's gates are gates to the forest, while others gate the forest. What is interesting about the gates of the campus is that they do not actually define its territory. Ironically and in accordance with the university's ideology; which is trying to establish a society with an entirely different school of thought; the gates close the campus from the city, the gate of the campus is the city itself, being of an entirely different mentality from the campus, aesthetically as well as ethically. There are nine gates in the campus but only five of them are accessible nowadays (A1, A2, A4, A7, A8), see figure3.12. While all the important gates of the campus connect to the city's main roads indirectly, and serve both as entrance and exit, A2 gate provides only vehicle exit directly to Eskisehir Road.

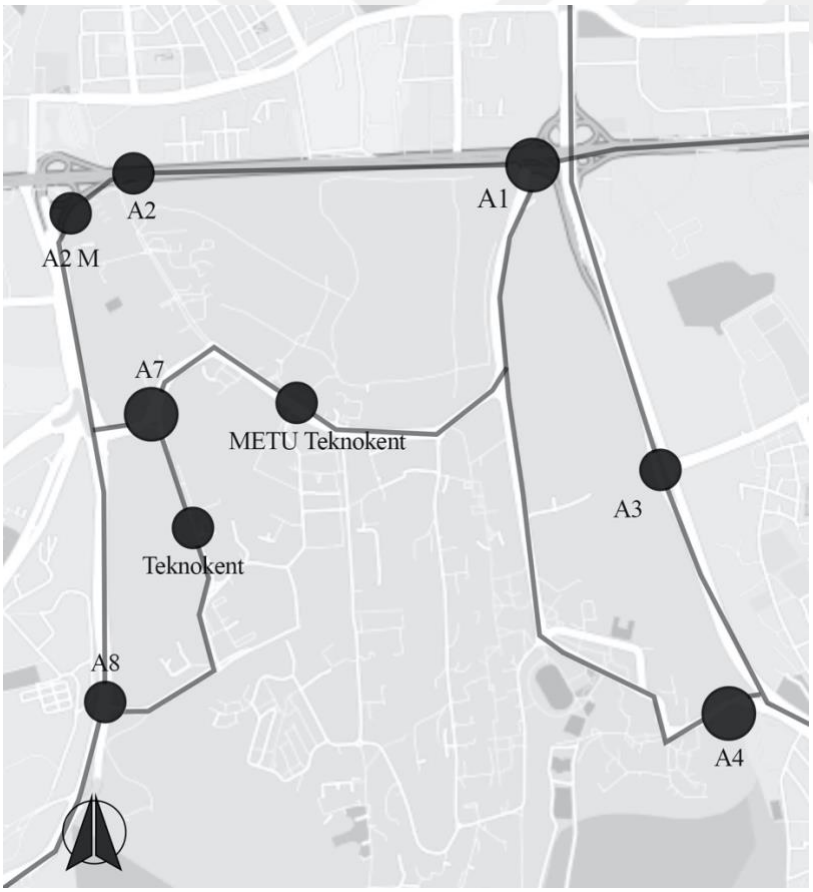


Figure 3.12: The location of the gates in the campus, drawn by the author

The gates of the campus have been given a great deal of importance in terms of their design and monumentality. They have a symbolic meaning in that the "gate" is an entrance into a new world, often synonymous with a new/different life. Seen from outside a gate point to the openness, it is inviting, and gives a passage to the unknown inside, whereas as seen from the inside the concept is related to enclosure and division. This goes along very well with the ideology of the university, which's main aim was to create a visionary community, isolated from the city but at the same time visible to the city, as an inspirational establishment. The gates of the campus offer a rendering of the visible invisibility. The detail and effort put in the design of the main gates gives an immediate grasp of the architectural values one is about to experience once entering the campus.

The origins of the gate idea date back to ancient civilizations such as Egypt and Mesopotamia. The gates are seen as portals that carry a special and ceremonial meaning.[65] In antiquity and not only, the gates are often followed with statues of animals or engravings of animals. The most commonly used animal in gates is the lion, for it represents protection. The Lion Gate, being the main entrance of the Bronze Age Citadel of Mycenae, southern Greece is important evidence of the monumental gates being guarded by lions. Not only, The Hittites were using the symbol of lions as the guardians of gates also as found from the ruins of Hattusha, the capital of the Hittite Empire. In ancient Egypt, Sphynx, a lion with a human head, is supposed to have the role of the protector of the sun's voyage during the night. The sun is supposed to carry the meaning of knowledge and illumination in antique beliefs. The campus's main gate A1, also carries its monumentality in the abstraction of the statue of a lion (figure 3.13). Following up with the logic of the previous examples the lion abstraction might be a symbol of the protection and power of the

[65] Haubold, Greece and Mesopotamia (The W. B. Stanford Memorial Lectures) *Cambridge University Press.* 2020



Figure 3.13: A1 Gate

knowledge that the university provides. The landscape of the campus begins right next to this gate. As shown in figure 3.13 there is a secondary passage through this gate that opens to a part of the forest, as seen illustrated in the first picture of group. The other gates of the campus are also carriers of great architectural values. They were designed in the later years of the opening of the campus. The gates shown below (figure 3.14), are gate A9, which is currently out of use, and gate A7, which connects our campus to Bilkent University's campus. Both gates have a modernist approach and sit very subtly to the already existing landscape. From the rear view these gates look like they are rising from the existing topography giving the sense of a natural scape. Since most of the gates are built in the middle of the two-way roads of the campus, their material is mainly concrete, preserving the aesthetic of the road and making their existence almost disguised and sophisticated.



Figure 3.14: A9 and A7 Gates

Later gate structures were added by different architects, also the members of METU Faculty of Architecture academic staff (Ayşen Savaş, Haluk Zelef, Barış Yağlı). Gates of the campus are part of the identity of the landscape as a whole. They complement to its aesthetics, for their architecturat values and the network of connections and relations they open up to.

3.5 Landscape Aesthetics

The landscape designates parts of a territory; its characteristics being a result of actions and interactions between natural and human factors. Landscapes contribute to ones's well-being, with their recognized functions as social, cultural, economic, or ecological ones.[66] Following this definition, the campus's landscape can be

[66] Prieur, M. (2006). Landscape and Sustainable Development: Challenges of the European Landscape Convention. Council of Europe Publishing.

defined in two major parts; the landscape inside the main campus and the forest continuing towards Eymir Lake. There are several characteristics that can be noticed in both of them. To start with the forest area, the meticulously ordered plantation of the trees is the first aesthetic element noticed. All the trees are placed in equally distanced locations from each other, following the topography lines of the site. This plantation method is very effective in the prevention of the landslides. Considering that the land type in Ankara and the campus site is generally a dry and a very sloppy one, this is a very well thought out and premeditated way of dealing with the site. In figure 3.15 is depicted the campus very soon after the afforestation process started, while figure 3.16 is a photo captured 3 years after the plantation started. Figure 3.16 illustrates also the order of the trees and their conformity to topography lines. The distance between the trees is approximately 3 to 5 meters; a spacing that is thought to be optimal for the trees to fully develop their branches and foliage. Figure 3.17 is a photo captured a couple of years ago with a drone, which again shows the precise ordering of the trees in the forest.

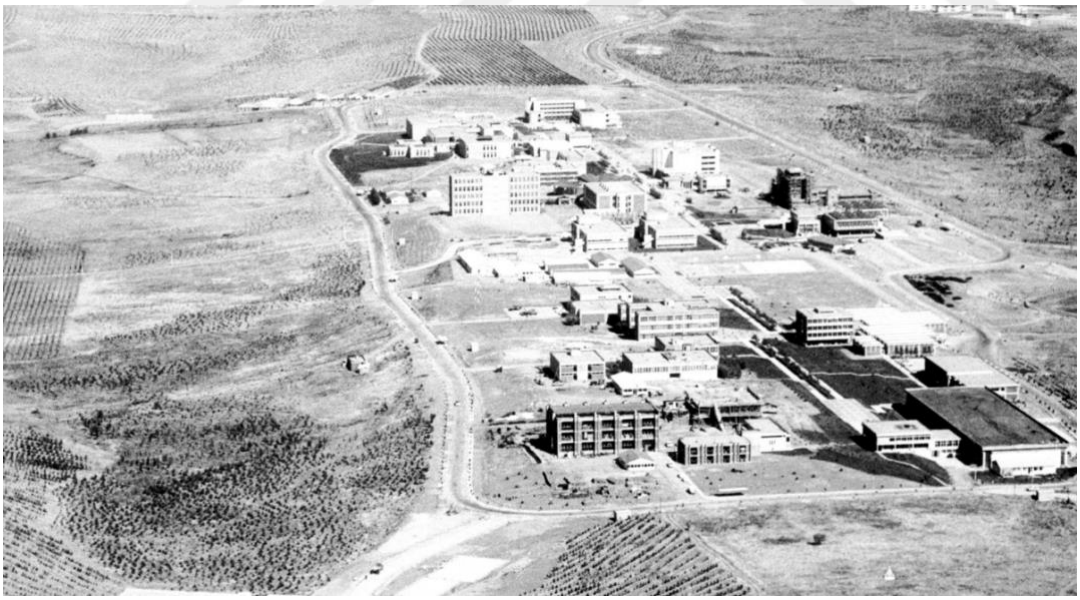


Figure 3.15: First years of the afforestation project



Figure 3.16: First years of afforestation project



Figure 3.17: Recent photo from the forest of METU Campus

Proceeding to the main campus area, the order in plantation is not strictly followed. There are areas which continue to have a line planning system, while there are others where the plantation tends to be irregular. According to the students of the time who have witnessed the afforestation process there are several reasons for the change in the method of planation. First and foremost, they affirm that the afforestation of the main campus started after the afforestation of the area towards Eymir Lake and the

areas in the campus planted at the same time with the forest preserve the order and the spacing same as the forest, such as the area between A4 and the dormitories. Also, the interventions on land of the main campus during the construction process eventually tamed the topography making it quite unnecessary for a strict spacing in the trees (land sliding was not a danger anymore). The construction of the buildings in the campus was a determinate for the location of many parts of the landscape in the area, so improvisations had to be made during the plantation process. It should not be left unmentioned that new trees are added each year, which also contributes to the transformation of the plantation system.

First and second picture in figure 3.18 demonstrates parts of the landscape in the main campus that are planted in the ordered system seemingly as the forest, while the third one illustrates an irregular distribution of the trees (the photo was taken behind the faculty of chemical engineering).



Figure 3.18: Landscape inside the main campus

There are several areas on the campus where the social activities and human presence/interaction is very vague. These areas look like almost abandoned places and are very different from the reality that we are used to see in the campus. Nevertheless, these spaces too are a composite of the landscape picture of the campus. Such examples are depicted in the figure 3.19.



Figure 3.19: Landscape outside the main campus

The afforestation project and the forest are a very important part of METU Campus identity as well as ecosystem. The landscape design of the main campus emerges from the forest and shapes itself in accordance with forest. One should gain a deep understanding of the forest of METU Campus, its history, features, and complexity, to be able to better fathom and analyze the landscape of the main campus.

CHAPTER 4

METU CAMPUS AS A TOPOLOGICAL GROUND

This chapter will explore the METU Campus as topological ground by analyzing the complex interrelations and connections of the landscape, archiecture and the users.

4.1 Understanding topological features

As stated before, this research aims to understand the formation of METU Campus as a topological space, in terms of relationships such as "continuity, connectivity and interface of user interaction", in different scales, as defined by Girot. To better understand the topology of a place, it is crucial to go to the mathematical roots of the term, which is being the structure of a topological space. A topological space is a geometrical space, defined as a set, whose elements are represented by points. Various definitions have been made upon topology, also known as "strictly abstract mathematics"[67], with no applications, however the open sets definition is vastly used, since it is easily manipulated and fits to topological definitions of other fields of application as well. Shortly, the open set principle is explained as it follows: "A topology on a set *X* may be defined as a collection *y* of subsets of *X".* In the below figure the subset combinations define the topology on the set X. These subsets, in geometry function by equivalent rules such as: "line features can share endpoints; area features can share boundaries; line features can share segments with other line features; area features can overlap with other area features; point features can share vertices with line features."[68] In other words, in mathematics, topology is the structure of connectiveness of a set, whose elements are interrelated in various forms

[67] Adams & Fanzosa, Introduction to topology, pure and applied, *Pearson Education,*
[68] Ibid.

with each other. Similar logic is worn to this terminology in other fields of applications too, see figure 4.1.

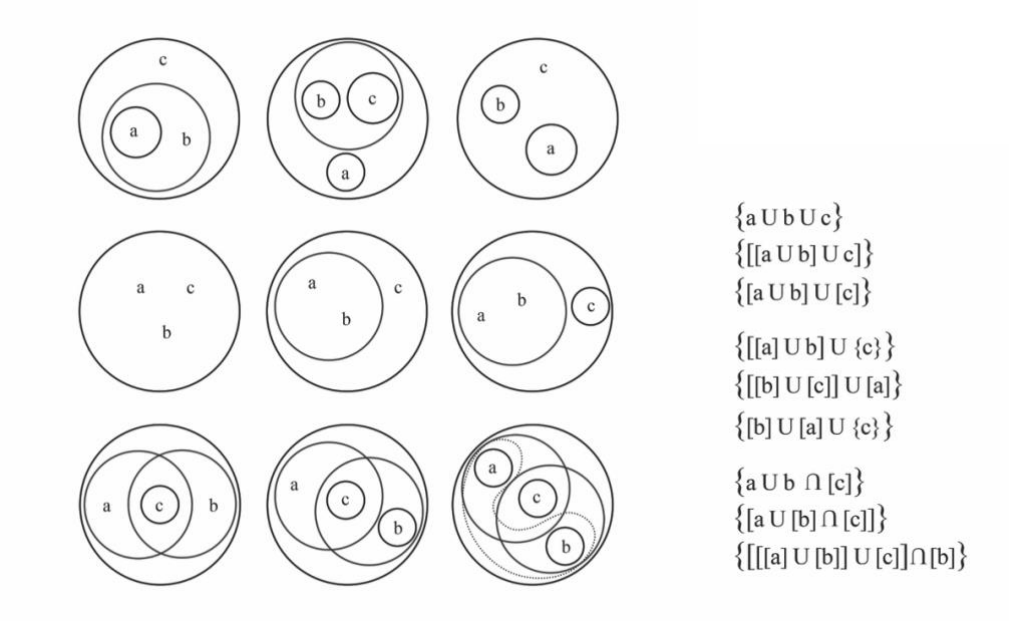


Figure 4.1: Open set principle, redrawn by the author

Topology's principles are very helpful in understanding the connectivity and relationships also in different phenomena. Despite being a very complex concept, topology narrows down to investigating networks of connectedness and continuity, at a larger scale, by understanding their relationships at a smaller scale. The figure above for instance, is the representation of permutations resulting of the 3 subsets of the set X. This principle, which in a primate way shows how inter-connectedness functions, which as mentioned, is common in other topology perceptions as well. When it comes to applying topological thinking to nature or landscape, the cognitive visual awakened is of an infinite network of inter-connections, juxtapositions and interlocks of different variables that assemble the topological relations, providing the continuity of the space as a whole (see figure 4.2).

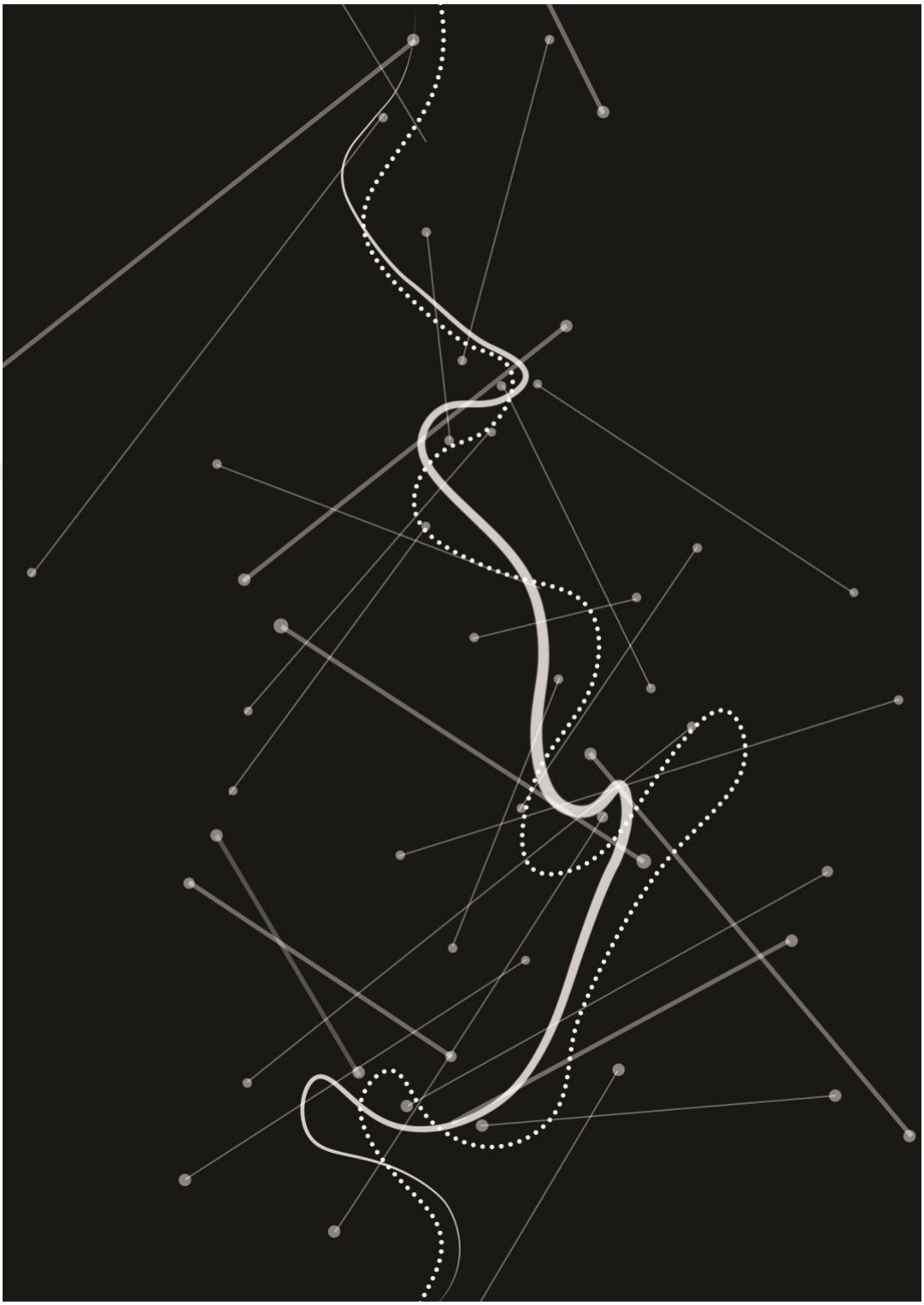


Figure 4.2: Imagining topological connectiveness, drawn by the author

In landscape, topological relations mostly define the interface of nature with the built environment, where boundaries play a significant role as they become catalysts for interaction between the objects, the landscape, and the users. On the METU campus, one often finds it perplexing to separate nature from the built environment, since there is a sense of deep interlock and ambiguity as regards belongingness to either nature's architecture or the fabricated one. Given that landscape is an ongoing process, one may never guess the final state of the system it comprises; nonetheless, it establishes a connection between the past, the present, and the future, highly dependable on time and change. What remains the same, is the cohesiveness and the coherent state of the system associated with the topological ground of the METU campus.

One shall only seek interrelated cohesiveness of parts in the diversity of juxtaposed elements, as homogeneity fails to generate rich topological relations. In "A Thousand Plateaus", Deluze identifies two types of natural structures' origins: strata and meshwork. In contrast to strata that emerges from the homogeneity of elements, meshwork brings stable behavioral patterns into being, through overlapping and interlocking heterogeneous elements. However, one should note that nature embodies both forms of structures. Fifteen years prior Deluze, Christopher Alexander defines two structures as regarding the relations of a city's constituents: the treelike hierarchy and the semilattice (A city is not a tree 1965). Similar to Deluze's meshwork, semilattice is characterized by interlocking and overlapping units, whereas tree-like hierarchical structures are characterized by disjoint relationships between lower scale elements (see figures 4.3 and 4.4). To illustrate how constituents of a semilattice cooperate via overlapping field effects Alexander (1965) gives the example of a streetcorner in Berkeley:

> "For example, in Berkeley at the corner of Hearst and Euclid, there is a drugstore, and outside the drugstore a traffic light. In the entrance to the drugstore there is a news rack where the day's papers are displayed. When the light is red, people who are waiting to cross the street stand idly by the light; and since they have nothing to do, they look at the papers displayed on the news rack which they can

see from where they stand. Some of them just read the headlines, others actually buy a paper while they wait.

This effect makes the news rack and the traffic light interactive; the news rack, the newspapers on it, the money going from people's pockets to the dime slot, the people who stop at the light and read papers, the traffic light, the electric impulses which make the lights change, and the sidewalk which the people stand on form a system – they all work together" (p. 2).

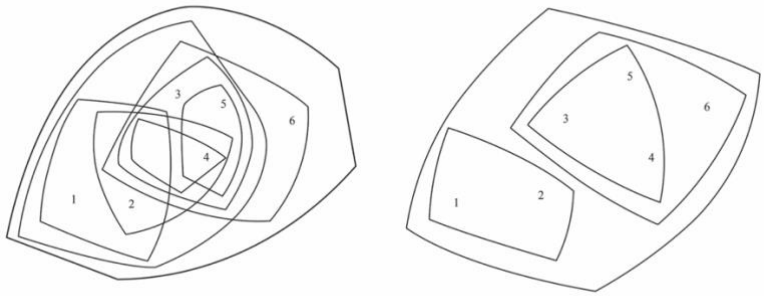


Figure 4.3: Alexander's semilattice structure, redrawn by the author

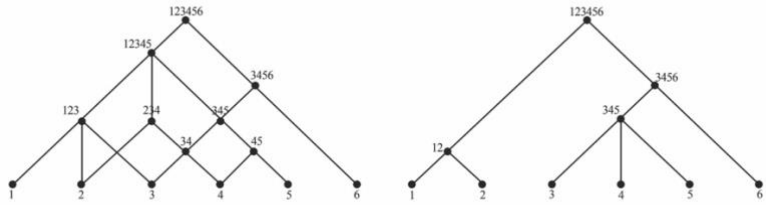


Figure 4.4: Alexander's tree-like hierarchical structure, redrawn by the author

To read the topology on METU Campus, this research focuses on three aspects of the general structure of the campus: the grid, the network, and the activity layout respectively. The first facet to be analyzed is the grid, which lays a general understanding of the design system of the campus, the space flow and interconnection between built and non-built environment, at a large scale. Network

on the other hand, examines the physical relationships between architecture, landscape, and user interaction in a smaller scale, while activity layout will focus on the life generated in the campus due to the topological connectedness.[69]

4.2 The Grid

"From earliest history humans' close kinship with nature has guided them toward a sense of proportion in the shaping of their world".[70]

Grid, an architectural framework used vastly in modernism, serves the purpose of arranging rational spatial organizations. Similarly, the grid of the campus, is an organizational and systematic layout of multiple scales, a structural and spatial framework to ease a healthy interconnection between the modules and an uninterrupted flow of the open spaces of the campus.[71] The university was designed as total entity, aimed by a three-dimensional modern grid spread over the barren Anatolian prairie.[72] One tends to imagine a three-dimensional grid that permeates all the space, aligning not only to buildings but also to each single urban element, wall, window, path or even landscape stripes. As for this rigid frame being non-existent, the assumed interconnections and networks in the campus generate to be way more complex. The 100x100 grid mediates the campus pattern in clusters, and it subdivides itself into incepted equally smaller grids to dictate details of smaller scales. The whole system resembles to an incepted illusion, where the grid lines break down in two and their products keep continually splitting too.[73]

---

[69] Ayşen Savaş Campus Utopias II; Creative Rereading Middle East Technical University Ankara, *Overholand* 2022 (in prep.)
[70] Hurlburt, A., *The Grid: A Modular System*, 1978
[71] Keeping it Modern Project Report, Getty Foundation, 2018
[72] University as a Society
[73] Ayşen Savaş Campus Utopias II; Creative Rereading Middle East Technical University Ankara, *Overholand* 2022 (in prep.)

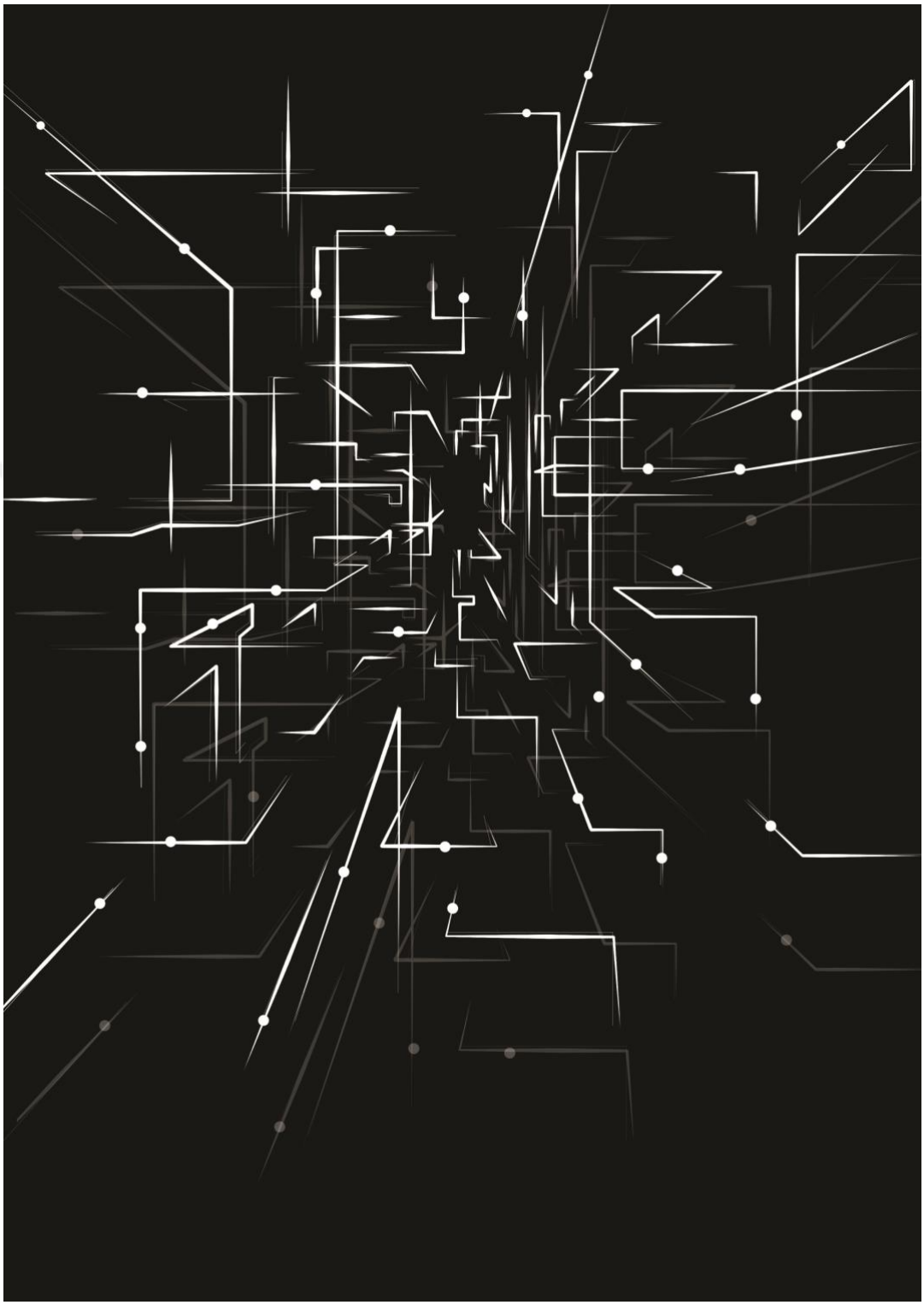


Figure 4.5: Abstract representation of the 3D Grid, drawn by the author

The three dimensionality of the grid allows and regulates the spatial organization on different levels, elements of the campus continually interconnect in different layers, proposing also a three-dimensional topological approach. Figure 4.5 is an abstraction of the grid of the campus, depicted perspectival as if it was a real and rigid framework.

4.3 The Network

Landscape can be understood scientifically, as a "normative network or an ecological system, yet it is a place that exists cognitively, poetically and emotionally for people."[74] Humans interactions with the environment, in this case landscape, play a role in shaping mental conceptions and perceptive experiences. That is why designing a landscape is an issue of immense matter and should dig deeper into the concept of topology, for topology's logic lies behind the patterns and internal relations that tend to dynamize relations, continuity, change and/or flexibility. Such approach is prone to awaken intuition in a designer, which has been vastly substituted by scientifical and/or AI solutions. Topological thinking relates to the intelligence of the ground, which is recognizing the substance and the structure of the ground, its surface and terrain, to be able to envision the interaction of its natural and built features and function as a successful place in engaging with its users. Apart from relating to, topology also shapes a particular intelligence of the terrain by understanding connectivity and complexity through recognition of landscape features, embedded on the ground.

To investigate the network of the campus as a topology, three different sets are taken in consideration being: Architecture, Landscape, and User Interaction. Each set contains numerous elements, which all display interconnected relations in between one another. The set of architecture divides into three main subsets being tectonics,

[74] Girot, Thoughts on Topology, 2012

voids, and in between spaces. Buildings, stairs, ramps, columns, extrusions, courtyards, outdoor rooms, intrusions, canopies, entrances, façade details, fenestration, atriums, and similar, are the elements distributed among the above-mentioned subsets. In the landscape set, elements of nature and hardscape are presented, varying such as pathways, paths, streets, urban furniture, sculptures, landmarks, retaining walls, trees, and plants. Other abstract factors, specifically weather and light condition are tightly connected to this set. The third set, being the user interaction divides into three subsets, namely premediated, emergent, and evolved. The user interaction constitutes to the user's activity type evoked by the space functions, quality, or changeability. All three main sets interacting with one another through multiscalar elements create different layers of interconnectedness, supporting spatial, physical, and functional continuity, which shapes the topological system through the METU Campus. The premediated and meticulous design of the campus serves to the coherent relations between the elements listed, shaping a cohesive space that preserves its complexity of a multi-layered settlement.

The interaction of the subsets of architecture and landscape in the campus, is of vast importance for it decides upon the user activity, its origin, flux, and density. Seemingly as architecture and landscape, and specifically their interrelations generate and enhance the user activity and interaction, the user activities are also of potential to shape new spaces and places significant to the campus. This loop-like system of interconnections and relations that depend on each other to function, is one of the main features that preserve the regenerative qualities of the campus through the years, being them physical and even spiritual. As Girot also explores, topology and topological features contribute actively to the recovery of the spirit of a place.[75] The self-sufficient and regenerative system of interrelations and connections of the METU Campus can be given a slight glimpse via the diagram below (figure 4.7).

[75] Girot, The elegance of topology: A return to site design, 2014

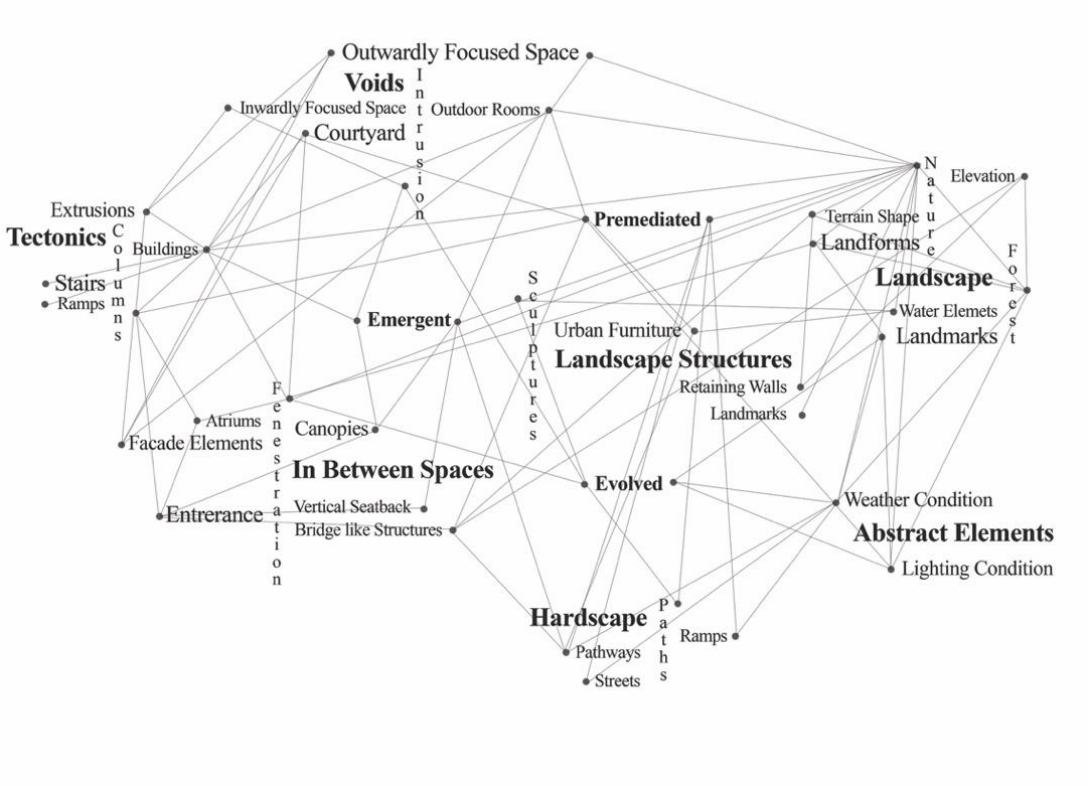


Figure 4.6: Abstract Mapping of interconnectedness inside the campus

The above diagram (figure 4.6) is a display of possible interactions between different elements being it from the same or from a different category. Mathematically speaking there are 278,256 possible permutations on different possible connections between campus elements. The generated image depicts the most common continual connections of elements, such as building-nature-water elements-weather condition and similar. The result resembles the meshwork type of natural structures', identified by Deluze. This type of structure emerges from stable behavioral patterns into being through overlapping and interlocking heterogeneous elements.

Following a similar logic from figure 4.7 a topology map is drawn above the campus' master plan, illustrating only the subsets of the pathway's connections and their interrelations through the university, for one to fathom the complexity of interconnections happening in it.

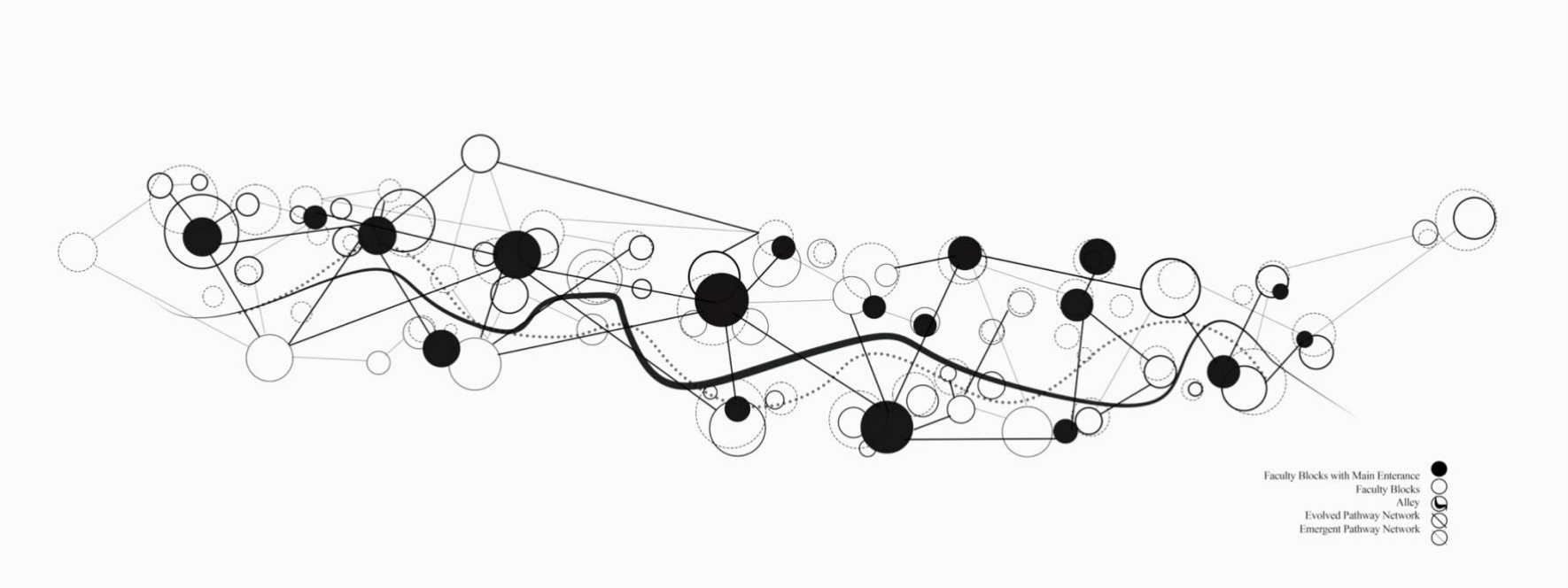


Figure 4.7: Interconnections of paths and pathways of the campus, drawn by the author

Pathways mostly, divide the campus surface into different areas, often only perceptual. Each distinct area in the campus consists of a geometrical field, that generates geometrical spaces, discerning various spatial qualities; the visuality and the function of which depends on the spatial connection of its elements. Inter-connections among the geometrical spaces are dictated vastly by proximity, being the source of overlaps that emerge various user activities. The whole system (see diagram 4.8), behaves as a semilattice structure, which as investigated before in this research, coequals the principles of topology in mathematics as well as in other sciences.

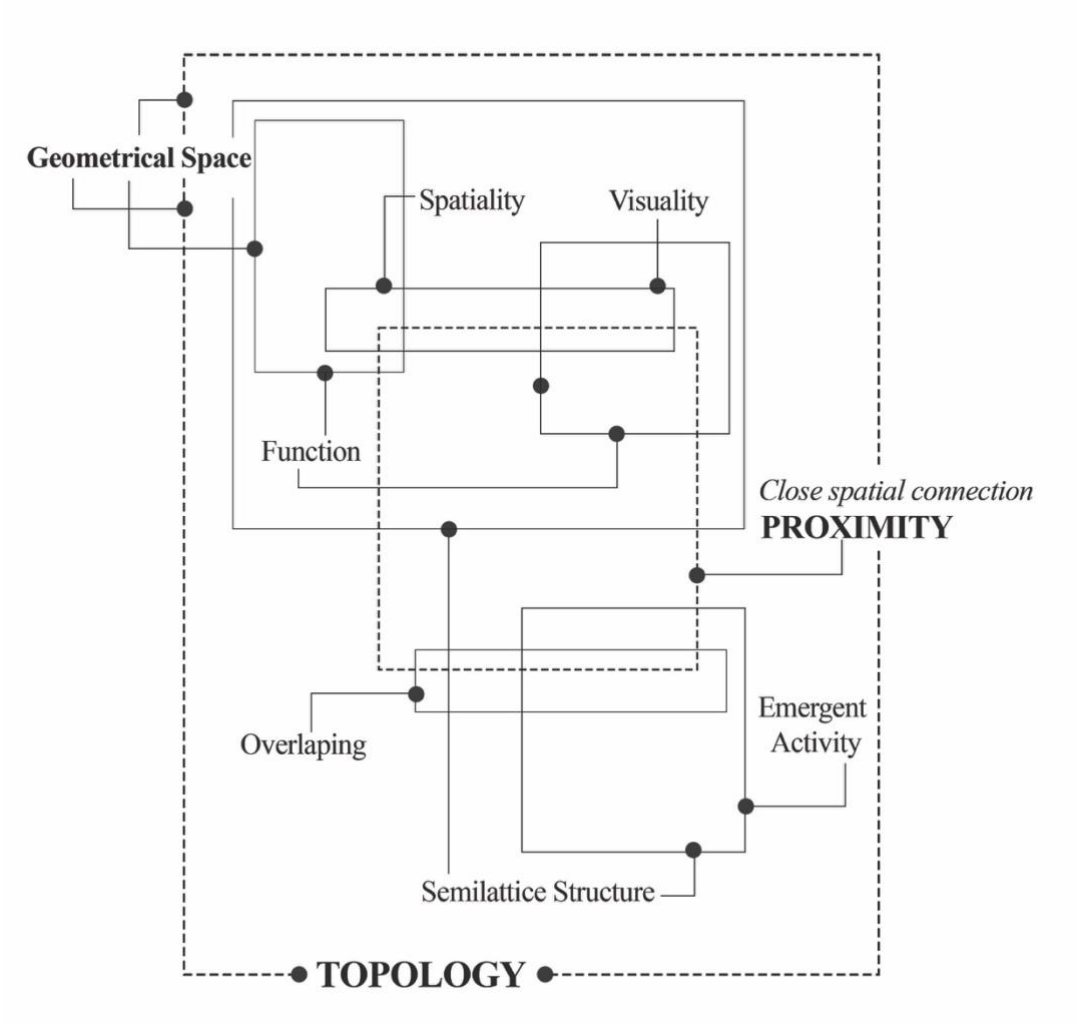


Figure 4.8: Mind Map of how topological space is formed, drawn by the author

4.3.1 Coupling as the basis for interrelations in topology

Salingaros (2000, p. 2) defines a city as a network of paths and asserts that "a coherent city must be plastic, i.e., able to follow the bending, extension, and compression of paths without tearing", that is "the urban fabric must be strongly connected on the smallest scale and loosely connected on the largest scale", that is the primate principle of the topological approaches. This idea is in accordance with laws of physics and structural principles of biological forms. What lies at the core of Salingaros' approach is an interaction of overlapping geometrical fields of objects. He defines this geometrical field as a function of information associated with shapes, surface textures, colors patterns and details, which either weaken or intensify via various combinations. As such, he introduces modules, which are couplings of elements on the same scale. Creating a strongly coupled module is the first step to generating strong and meaningful relations.

This rule explains how successful modules can emerge via couplings of elements on the same scale. According to Salingaros, a module contains only connected elements whose interactions depend on their shapes and positions. Salingaros' couplings refer to elements which intensify each other, functionally, structurally, and visually. They are not mere juxtapositions. A whole which is interrelated and cohesive in the topological aspect requires strong couplings on its smallest scales. Salingaros identifies five ways how coupling may occur: coupling via color contrast, coupling via contrast of texture, coupling via permeability, coupling via a common third element, and coupling via interpenetration. When one considers landscape, another form of coupling is discernible, coupling via inflection[76], which indicates elements bending or curving outward themselves to create continuity and enclosure. According to Salingaros' formulation, no coupling occurs between identical or similar elements; hence one can conclude that the rule of diversity is associated with

[76] Coupling via inflection is a method added by the author, inspired by examples from the campus

the property of contrast. To form a module, two elements of the same scale must be of contrasting properties, a condition that enables mutual reinforcement. Several coupling examples from METU Campus will be demonstrated below, see figure 4.9, illustrating diverse forms of how nature connects with architecture, vice versa and how they engage users to interact.

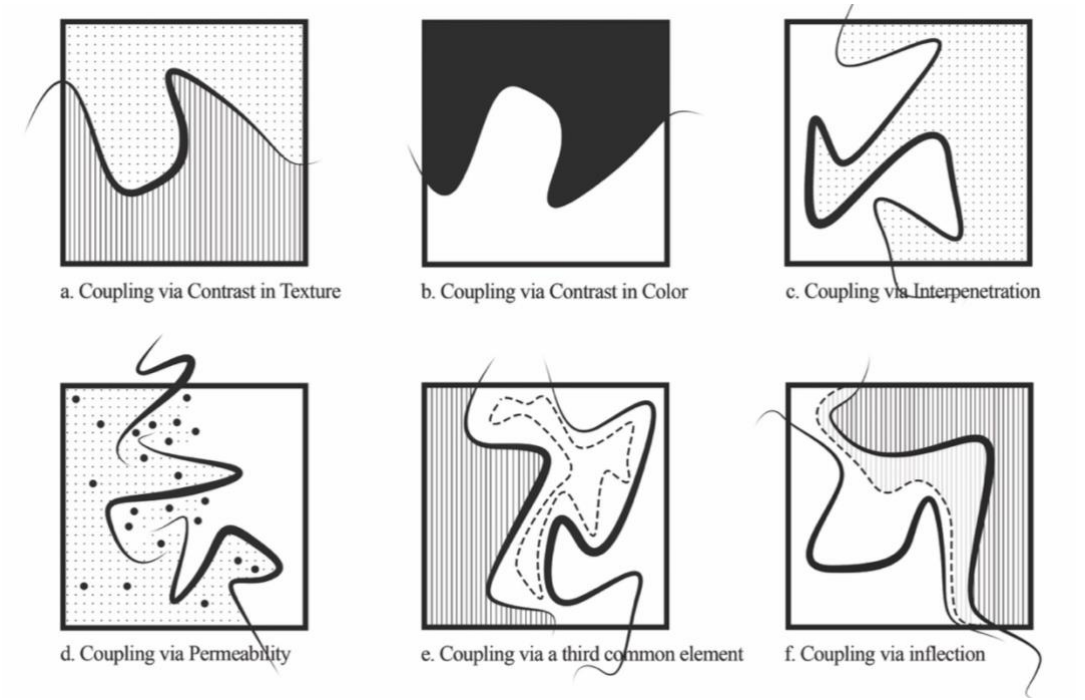


Figure 4.9: Interrelations by coupling, redrawn by the author.[77]

Coupling via contrast in texture, via contrast in color, via interpenetration, via permeability, via a third common element and via inflection will be demonstrated below with examples from the METU Campus. These coupling methods are of great importance in that they instigate connectivity in the smaller scale that makes up for the continual and coherent character of the campus at the largest scale.

[77] Inspired by the coupling theory of Nikos Salingaros, *Complexity and Urban Coherence*, 2000

a. Coupling via contrast in texture



Figure 4.10: Pictures from the campus, examples from METU Campus

The most common coupling seen in the campus is that of coupling via contrast in texture, in which nature directly interacts with the building, or the built environment. The flora that has blossomed as the years pass by has consensually invaded some of the buildings in the main campus. The aesthetics created are very romantic and determinate the mood of the campus in different seasons of the year. Pictures 1a, b, c, d, and e, on figure 4.10, are captured from the faculty of architecture building in different times of the year. It is quite obvious that change in the juxta-positioned texture of this coupling creates different impacts for the users also. Picture 2 and 4 on the other hand are both captured from the faculty of architecture's entrance; 2 demonstrating how the building meets the ground, while the other its coupling with water. Water elements are used in the campus as catalysators to mediate the connection of a building to the surrounding landscape. In most of the cases they

function as complementary elements to other design decisions (as in the case of library building) or play a crucial role in the shaping the identity of a building effecting other relationships towards nature and the users (as in the case of architecture faculty building). Figure 4.11 illustrates the pool around the library building, whose main function is to gather water from rain and snow, which later disperses through the circulation system as shown in the figure. The design of the rainwater circulation system is perfectly hindered to be a part of the overall landscape language of the campus; not disrupt the flow and the aesthetics of it, which at the same time is another principle of topological thinking in landscape. As Girot in his "Elegance of Topology" essay suggests, topology "is about combining the technical and the aesthetic elegantly in a physical conception of place, embracing higher social and cultural values that go with it."[78] This and similar details are very intriguing in that how the campus functions and flows as a whole, despite its complexity.



Figure 4.11: Main library building

Picture 3, figure 4.10, on the other hand, especially holds a great importance in that it depicts a massive building of elevated, layered, and extruded blocks whose abundance is alleviated by the greenery interfering in each level and layer. The

[78] Christophe Girot, Elegance of topology, *Thinking about contemporary landscape architecture*.

coupling of these elements extends far more than texture; it is an example of an adaptive topological intelligence, where the flora spreads into a building, yet it recognizes its volume, surface, and shape. Some of these examples are also part of coupling via contrast in color.

b. Coupling via contrast in color



Figure 4.12: Coupling via color contrast, examples from METU Campus

Coupling via color contrast seems to be an effortless interaction in the METU Campus. The vibrant energy the greenery emits, is subtly toned down by the cold colors of the natural materials used for the built environment. This interaction mode is interfused also with the coupling via contrast in texture, for the color of the nature layer almost always differs from that of the built. The intersection in between different couplings generate a greater diversity in the pattern of the campus. Picture

5 in figure 4.12, illustrates the noble identity an entrance carries; from its material and the longitudinal pathway guiding one towards it, while pleasantly disrupting the monochronic green palette of the frame. Picture 6 it is also very interesting for that apart from the green color coming from the flora, the water elements also reflect green, in different tones, depending on the sunlight. This way the water ensures a deeper contrast with the naked concrete of the architecture faculty building.

c. Coupling via interpenetration, subtraction



Figure 4.13: Coupling by interpenetration; examples from METU Campus[79]

Intersection by subtraction and unity, are the main operations undertaken in topological relations, as explained by the open set logic in the first part of this chapter. In a three-dimensional topology, intersection and unity transform into

[79] Picture 1 in figure 4.14 is retrieved from SALT Archive

Boolean Subtraction and Boolean Union. Courtyards inside the several buildings in the campus are an example of Boolean Intersection. Pictures 2,4,5, figure 4.13 are taken from the faculty of architecture. Despite breaking the monotony of interior spaces, enhancing the lighting of the building, and creating a pleasant scenery, these spaces are great catalysators of augmented interference between the users of the buildings. This is a feature that adds to the identity of the building. The flora inside the courtyard, its coupling by contrast and texture, makes these intruded spaces a part of the whole topological system. Picture 1 is also an intersection between two volumes in the rectorate building, that creates a functional passage, generates shadow, thus emerges interactions and softens the firmness of the rectorate as an establishment, by being inviting to the passersby. Apart from intersection, in the campus there are several examples of Boolean Unity too, where a volume extrudes to create a transition space, often utilized for lighting, see figure 4.14.



Figure 4.14: Coupling via interpenetration, union

d. Coupling via permeability



Figure 4.15: Coupling via permeability, examples from METU Campus

The large modernist windows that surround each building on METU Campus, manage to permeate nature inside the volume, adding depth and light to the interior spaces. This subtle communication with nature carries the network of connections and relationships in the landscape of the campus toward the buildings itself.

Yet, the communication of the buildings with nature is not always intermediated by a physical and built connection. In various cases, their contact is natural, far more aesthetic, or abstract. The following example, figure 4.15, picture 5 and 6, depict a very delicate touch in the exterior of a building, which frames a part of the landscape surrounding the faculty in question. Similarly picture 9 of figure 4.16 shows another framing of the nature, from the exterior of the building, in a vertical direction, framing the skylight.

Coupling via permeability II, Framing the Landscape



Figure 4.16: Framing the Landscape, examples from METU Campus

The faculties of the campus are delicately engaged with nature. The landscape seems to tame the buildings into entities of its own. The building landscape communication throughout the campus is very dynamic and creatively changes form depending on the necessity, which follows Girot's logic in that "topology is first and foremost about understanding the aesthetic substrate of a site and acting where it matters in the most nurturing design".[80] Elements such as stairs, paths, bridges, entrances, or walls enable connection, as a mediator or a third element. These spaces are usually spaces of transition or in between spaces, that create emergent user interactions. It is

[80] Christophe Girot, Elegance of topology, *Thinking about contemporary landscape architecture*.

interesting to discover how these elements are differently designed in each case to better adapt to the building design language, see figure 4.17.

e. Coupling via a third element I



Figure 4.17: Coupling via third element, examples from METU Campus

A great deal of staircases is encountered while walking throughout the campus. Their overall language of form follows that of the building and their railings each consist of specific designs. Picture 1 from figure 4.18 shows the staircase located in the rear side of the cafeteria building. Vertical and horizontal intersected concrete planes shape a unity that repeatedly interlaces itself to form the railing of this staircase. This method is only used in this staircase, similar to a lot of others that are exclusive to only one building.

Coupling via a third element



Figure 4.18: Coupling via third element

Picture 2 from figure 4.18 on the other hand, is taken on the other side of the same stair. To disguise a hollow void created between the building and the staircase, the architect used a vertical plane as a side railing, still without disturbing the overall minimalist brutalist approach to the design.

Picture 6 in figure 4.18, is a staircase found in mechanical engineering building. Two separate building blocks face each other while sharing the same landscape. The distance between the two blocks is fairly short, which is one of the reasons of the architect curving the staircase, efficiently making use of the space in question. The sides of this staircase also consist of a curved concrete plane, which aesthetically do not interrupt the communication between the stair and the paved ground towards the other block.

f. Coupling via inflection[81]



Figure 4.19: Coupling via inflection, examples from METU Campus

> "*Inflection is a means of distinguishing diverse parts while implying continuity. It involves the art of fragment. The fragment implies richness and meaning beyond itself. It can also be used to achieve suspense, an element possible in large sequential complexes."*[82]

Inflection is a way of promoting fragmentation but insinuating continuity. In various examples from the campus, an element fragments itself to engage into a greater connection with nature. In other examples, such as seen in picture 3 of figure 4.19, nature itself inflates to create smaller subspaces. Inflection allows continuity through hollowness and augments the connectedness of different elements in the campus. Often times, coupling by inflection in the campus is a phenomenon of visual implementation only, while others are a result of design decisions taken upon functionality purposes. Such a case is illustrated on picture 4 of figure 4.19, where the auditoriums of the faculty building create a voluminous extrusion that inflects effortlessly with the surrounding landscape.

[81]Coupling via inflection is a coupling method added by the author, supported by the observations in the campus

[82] Robert Venturi. The obligation toward the difficult whole

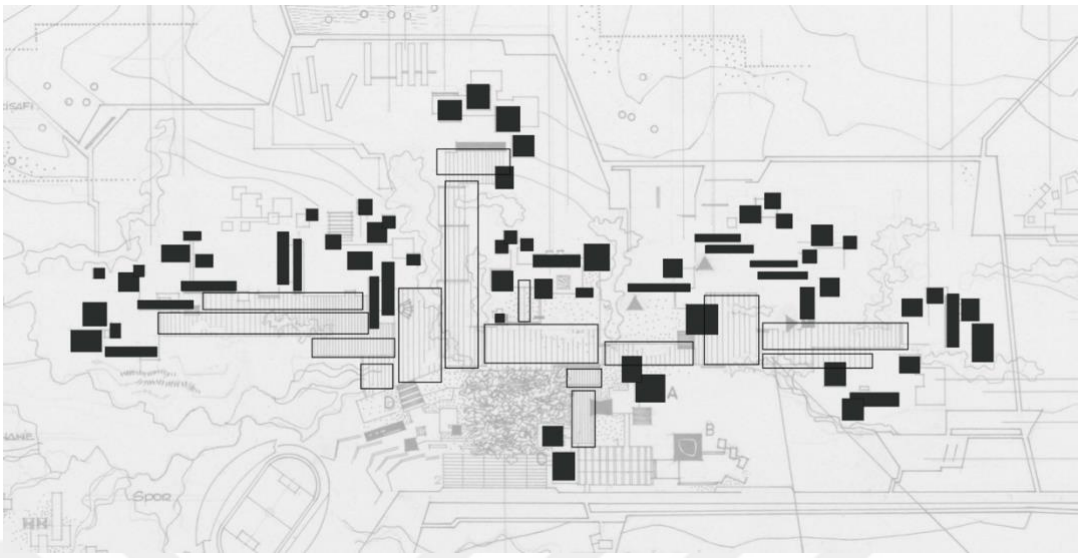


Figure 4.20: The whole METU Campus is an act of fragmentation

Once zoomed out, the master plan of the campus itself is an act of continual fragmentation. The outdoor spaces, the alley and the buildings fragment themselves to create a greater connection and communication with one another. This scheme, as illustrated on picture 4.20, reiterates how parts form wholes and how the whole is the juxtaposition, the interconnection and intersection of the parts. The communication of the parts supports the continuity of the inner system of the whole. The way the parts liaise to one another depends on various factors, one of which is proximity.

4.3.2 The Whole and Proximity

To estimate the potentials of difference within a system, one needs to identify its entity as a whole. Alexander (2002) describes the whole as any part of space whose structure is defined by all the various coherent units that exist in that part of space, and the way these entities are assembled in and overlap with each other. He depicts the problem of the wholeness with a very simple structure, such as a blank paper, trying to observe the pervasive change in its wholeness as a dot its placed on it, see figure 4.21.

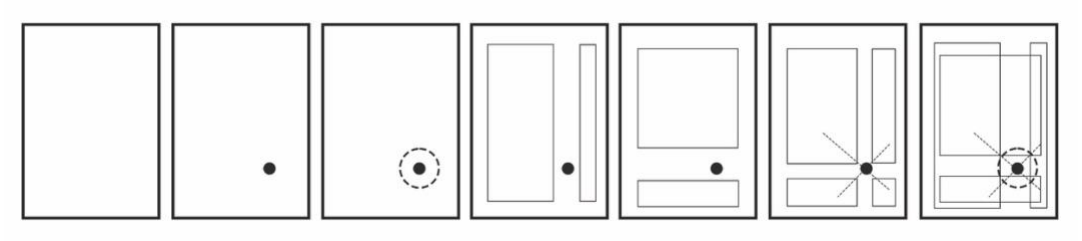


Figure 4.21: The whole as explained by Alexander, redrawn by the author

As the dot is introduced in the paper, the wholeness changes drastically. One's perception of the whole changes as the gestalt of the paper changes. The space throughout the sheet of paper alters, creating differentiations and vectors that construct new configurations. The dot, the halo worn around the dot, the subspaces, vectors, and their overlapping, establish zones, not visible for the eye while the sheet is blank. As Alexander states, the zones become coherent and differentiated, aided just by the addition of the dot.[83] If other dots were to be added to the sheet, the same process would apply, consisting in overlayered juxtaposed zones, differentiated but in a coherent communication. The dots create circumstantial centers, which unfold into other zones overlapping, increasing pattern differentiation. These interrelations create shape the whole, whose basis is coherence according to Alexander (2001). Çalışkan (2017), adds to the above statement by suggesting that spatial proximity and consistency are the main factors to evaluating the coherence of an urban fabric. If an urban fabric or physical whole were to be considered, such as METU Campus, the creation of different centers would translate as similar: different zones that interconnect and overlap in proximal basis, maintaining the consistency and the coherence of the system. The intersections and the unions of these zones generate a multiplication of pattern differentiation, which by and large straightly impacts the user interferences with the campus.

[83] Christopher Alexander, *The Nature of Order*, 2002

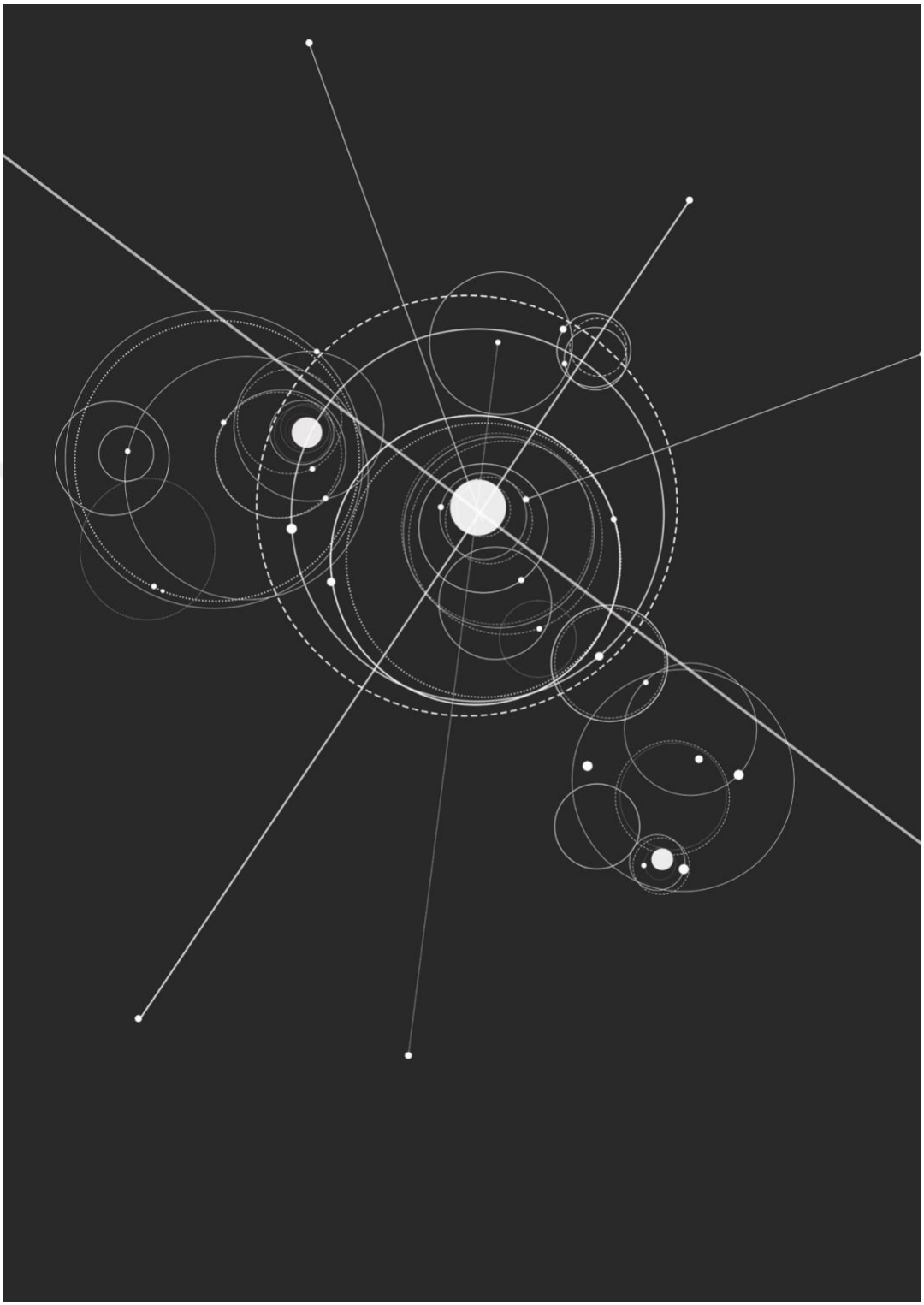


Figure 4.22: An imaginative representation of the formation of circumstantial centers and of the zones around them, drawn by the author

Figure 4.22 depicts an abstract representation of how circumstantial centers appearing randomly in a space create their individual halos, that grow into zones of different scales, inevitably intersecting and connecting with one another. Their connectedness in the whole, is tightly relayed on the repeated consistency of close spatial zones interrelating with each other.

Figure 4.23 is a diagram of several possible relational cases of built and natural environment, following the logic of how the creation of different centers inside a whole, increase interconnectedness, thus instigating a higher interaction among users. The centers might be a building, a pathway, or a part of the landscape itself. The user interaction and density augments in direct proportion with the differentiation in pattern of the zone.

The illustrations on figure 4.23, are patterns of possible communications between landscape, hardscape, and the user interaction they impose as a result, extracted from METU Campus layout, and abstracted to be legible in terms of a topological approach. The activities users endure, qualitatively and quantitively, are in accordance with the spatial unity offered by the diversity of compositions. User interactions are prominent in zones of vast overlaps and interconnectedness of elements, where the proximity between nature and built elements is greater. As Olgu Caliskan states "proximity, in the sense of a close spatial connection among the constitutional elements of any composition, and consistency, at the level of connectivity (by spatial closeness) supports the harmonious wholeness."[84]

As mentioned, the representation on figure 4.23 is based on details from the METU Campus. Every spot and element are a center whose positions with respect to other neighboring centers create overlapping fields account thus for higher possibilities of

[84] Olgu Caliskan, *Urban Coherence: A Morphological Definition*.

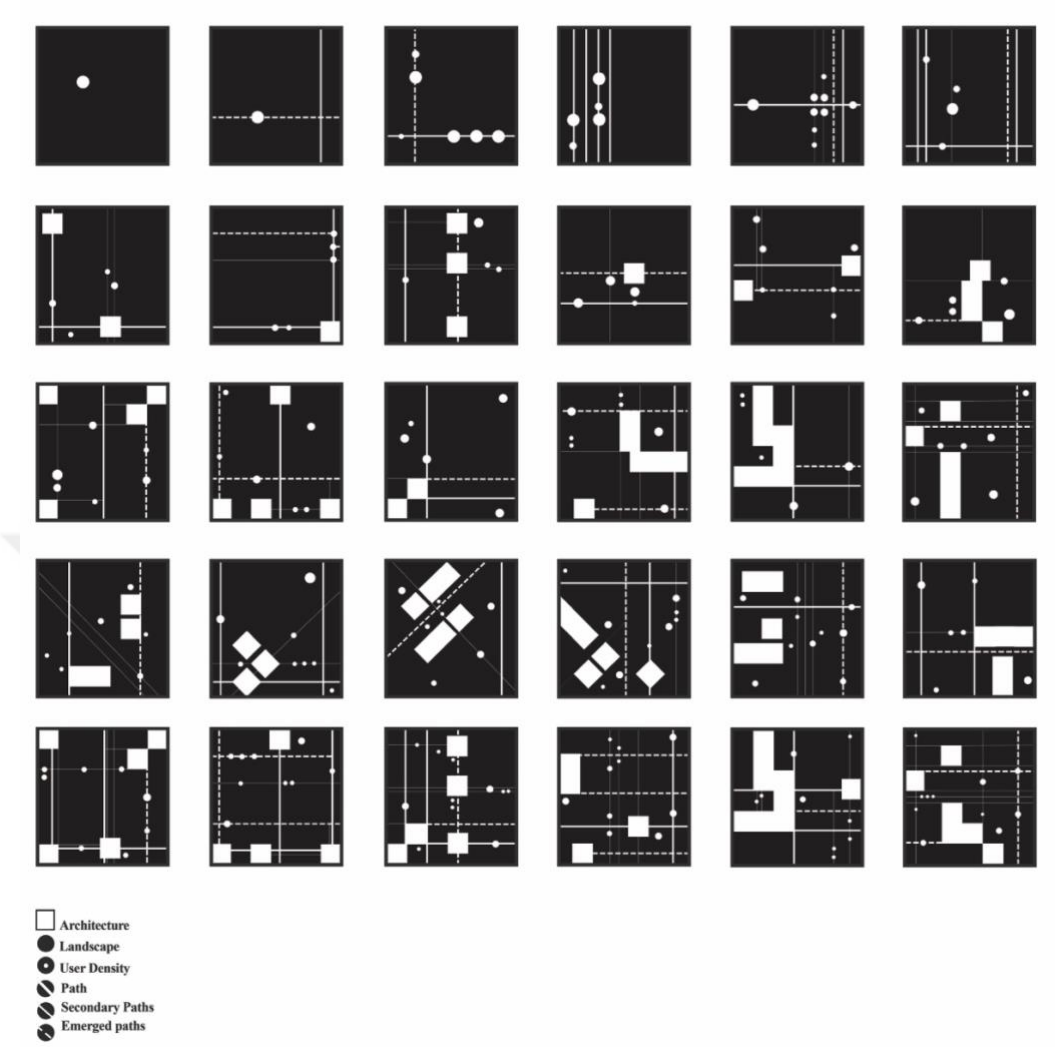


Figure 4.23: Topological diagram of the relationship between nature, architecture, and user, drawn by the author[85]

connections within the Network of the METU Campus. One can notice how every added center instigates connection and reinforces the neighboring centers spatially and functionally. The following figure 4.24, on the other hand, is a zoomed in pattern

[85] Intensity of user interaction increases as the diversity in texture or color increases

of architecture faculty's building interrelating with the surrounding landscape and connecting through pathways to the alley and rest of the campus.

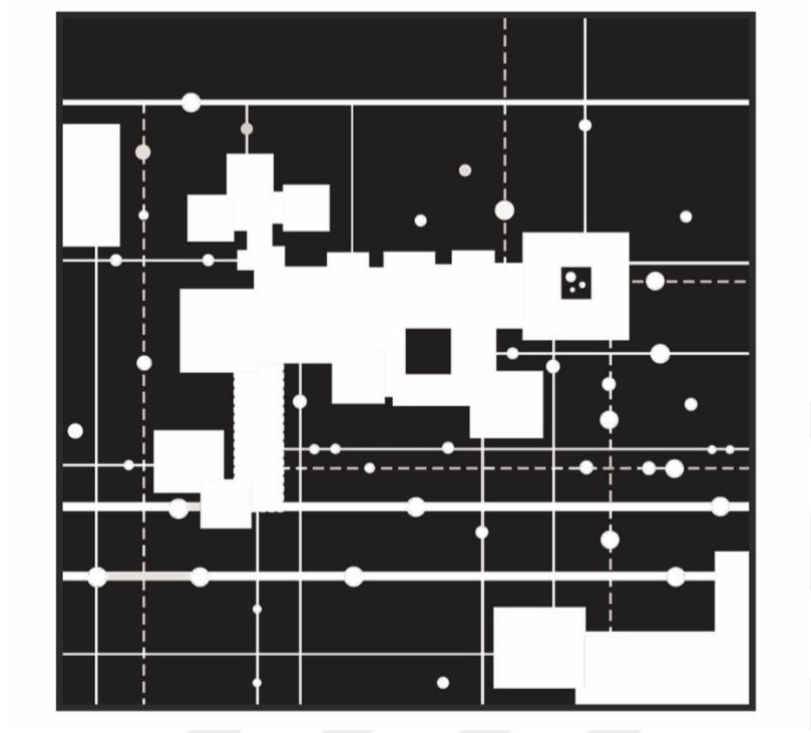


Figure 4.24: The network in architecture building in METU Campus

4.4 The Activity Layout

In an environment where human scale is a factor at play, there exist patterns of behavior shaped by the topological relations between nature and the built environment. The condition of connectedness by coherence among the elements of architectural objects and the landscape itself enables the designers to generate an environment that promotes human scale within the topological ground, shaping the activity layout of the campus. Given that the METU campus embodies artefactual, biological, ecological, and systems complexity, one should note that life on the campus grows bottom up, almost like Alexander's tree like hierarchical structure. Therefore, it is of importance to understand how human scale is accentuated on the smallest scale through coherently interrelated elements, to better fathom the activity

layout. As Salingaros (2000) maintains, complex interacting systems provide an insight into how the coherence of space, thus a greater interaction to it may be generated. Drawing inspiration from structural principles formulated in biology, computer science, and economics he extracts several rules for generating coherence in the built environment. He highlights the significance of a tight interaction among elements of the lowest scale to achieve the assemblage of interrelated large-scale coherent wholes. Furthermore, he states that diverse elements and functions should be contained on the smallest scale.

As regards to activity layout, components of human scale which account for anything accessible to a pedestrian at arm's length, are the key factors to initiation of the user interactions and activities on the campus. In an open space, the coupling between the solid and the void takes shape based on the character of the boundary it is enclosed by. The diversity of elements comprising the METU Campus has accounted for a variety of open spaces, each bounded successfully by a symbiosis of nature and architectural objects.

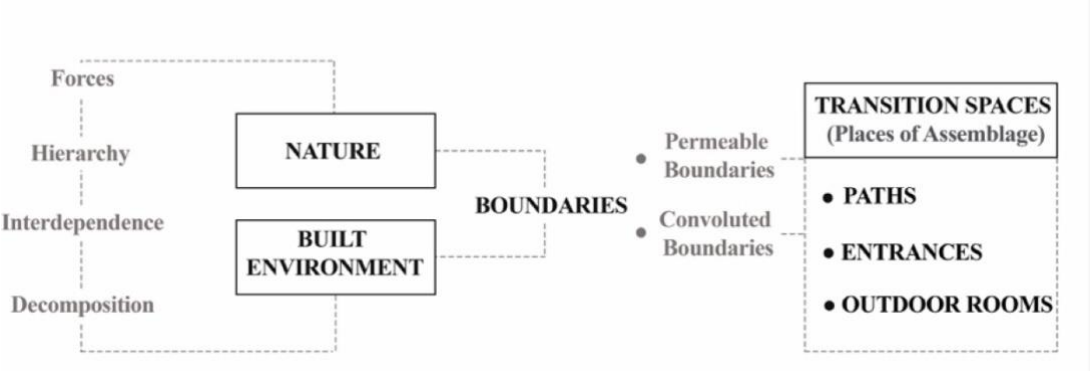


Figure 4.25: Boundaries between nature and architecture generate the life in campus

Built environment and nature in the METU Campus interact cohesively following the rules of forces, hierarchy, interdependence and decomposition, principles elaborated by Salingaros (2000), see figure 4.25. The boundaries created in the interaction of the two, separate into permeable and convoluted boundaries, that will be furtherly explored below. The permeable boundaries in the campus appear mostly as transition spaces, which invite users to assemble, whereas convoluted boundaries

consist of paths, entrances and/or outdoor room. These are generally places for walking, standing, sitting, talking, hearing[86], or in other word places of momentary assemblage.

4.4.1 Places of assemblage and momentary assemblage

Visual and spatial qualities of open spaces on the METU Campus are dependent on the geometrical properties and the topological relations of elements comprising boundaries. Salingaros (2000) states that boundary elements generate coupling between different modules and each element is a stimulus for the user to engage in a certain activity. The landscape and the built structures contain information that acts as a catalyst of a coupling also with the user. Salingaros uses the term interface while defining two successfully achieved boundaries, which resemble "either a permeable membrane with holes to allow for interchange, or a folded curtain with an edge that looks like a meandering river on a plan (2000, p. 10). On The Metu Campus there are many examples of paths that are bounded by trees that both unite and separate nature and the built (see figure 4.26). The convolution or the folding of the boundaries occurs when aligned buildings couple with the paths and the alley via the way their volumetric masses interlocking with the void. One encounters the convolution of spaces in campus mostly in the form of main entrances of various buildings, see figure 4.27. The main entrance of the main library building, as shown in the figure, extrudes towards the alley, creating an in between space, utilized by library users as the main spot for their study breaks. Both of these boundaries create transition spaces, which account for a rich variety of human activities on the METU Campus. According to Jan Gehl these are spaces that instigate life between buildings; they assemble, integrate, invite, and open to the rest of the whole.[87] Other similar spaces in the campus consist of colonnades, aisles, courtyards, water elements,

[86] Jan Gehl, *Life between buildings,* 1971
[87] Ibid.

pergolas, doorways, foyers, alley and similar. If activities and people are assembled, Gehl states, events of individual character recurrently stimulate each other.

> *"If people and events are assembled sensibly, the result will usually be improved conditions for communal activities as well as for privacy. On one side of the dwelling is a street – on the other side there will be room for a veritable forest."*[88]

Activities instigated in the convoluted borders of architecture and nature are of an inviting type, that translate in spaces for walking and staying according to Gehl's categorization. These, initiate walking, standing, sitting, seeing, hearing, and talking[89], differently translated as momentary assemblages, core acts of practice that shape the scheme of the continual activities on the campus.



Figure 4.26: Pathways in the Campus, examples of permeable membrane boundaries

[88] Ibid, p.82
[89] Ibid, p.128



Figure 4.27: Entrance of the library building, an in between/transitional space[90]

Forces are what hold the constituents of a system and elements together via different topological relations. According to Salingaros (2000), force is stronger if the difference in potential between elements is larger. A difference in potential translates into the urban context as a difference in qualities within a short distance; implying a stronger coupling force whenever there is greater contrast in qualities such as texture, color, or curvature of the interface. The METU Campus provides a rich environment of these contrasts, which is associated with forces holding natural and architectural elements together. Some of these places are designed for staying, whereas other places invite users to gaze, sit or stand. According to Gehl, these are the types of spaces that awakens one's desire to stay, see, hear and/or talk, (see figure 4.28).[91]

[90] Photo from Salt Research Archive, retrieved from: https://archives.saltresearch.org/handle/123456789/91015
[91] Gehl, J., Life between buildings

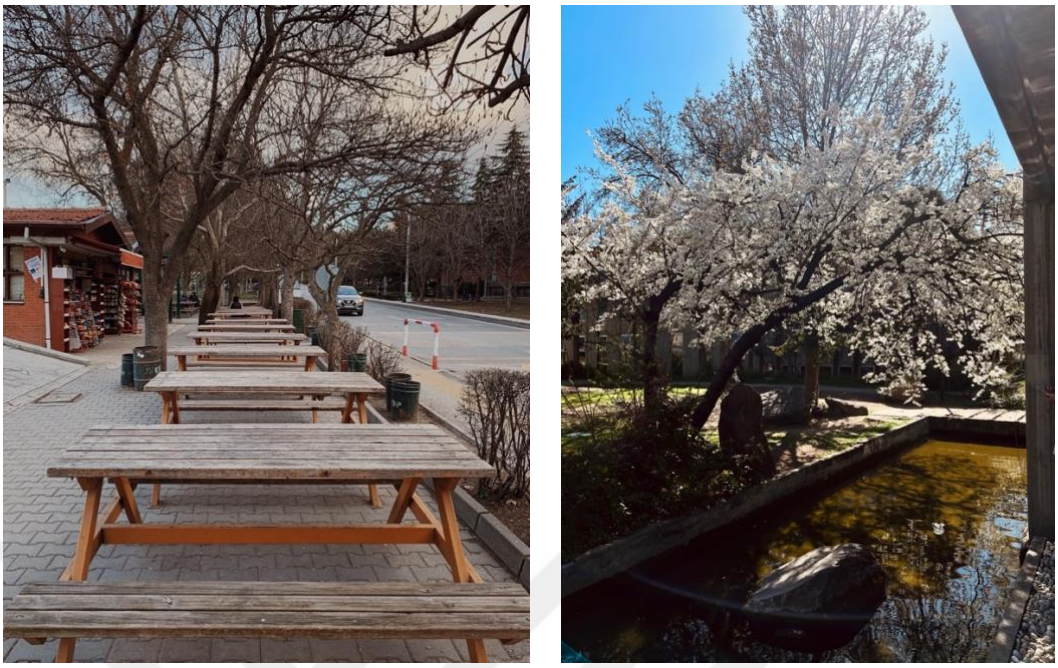


Figure 4.28: Places for staying, talking, hearing, and seeing

The organization on the largest scale of the METU Campus is highly dependent on the well-defined structures of the elements on the smaller scales. This rule is necessary for the fact that successful couplings on the smallest scales do not always generate interrelated cohesive wholes topologically. For that, the grid plays a significant role in establishing a framework that controls topological relations between the built environment, nature, and the users on the largest scale. Salingaros (2000) emphasizes the importance of alignment as an underlying principle for organizations on the large scale. However, alignment should unfold in a way that does not compromise the strong couplings between the low-scale elements, that leads to rule of hierarchy, which revolves around the idea that “a system’s components assemble progressively from small to large” and “this process generates linked unis defined on many distinct scales” (Salingaros, 2000, p. 4). Hierarchy highlights a sequential emergence of large scales from small scales. A topologically successful system is imbued with small, intermediate, and large scales, connected via short-range and long-range forces. One can state that hierarchy plays a significant role in

the assemblage of wholes whose constituents are connected across the scales. This connection takes place in METU Campus mostly via different landscape elements such as fountains, statues, or similar, or via urban furniture as illustrated on figure 4.29. According to Gahl, these spaces generally are spaces of standing or sitting.



Figure 4.29: Low scale elements and urban furniture

Salingaros (2000) maintains that there is a dependence of the large scale on the small scales it encompasses and not vice versa. In that sense, strongly coupled elements of small scales can exist independently from larger scales in which they are contained. Therefore, an organization imposed on a large scale should be done in a way that does not jeopardize the quality of the topological relations of couplings on the small scale. The grid of the METU Campus is efficient in the organization of small-scale couplings into a larger coherent whole, leaving space for adaptation and evolution of the ecosystem which regenerates the activity layout.

Coherent systems can never be decomposed into their components without causing a loss of their intricacy, as they are not separate, given the well-established topological relations. The system cannot be disentangled as the process of reassembling them would never result in the same compositional and configurational qualities. The METU campus is a perfect explanation of the mantra “The whole is more than the sum of its parts.” The plethora of overlapping units generating life on campus form a semi-lattice structure where the replacement of any element might risk the coherent state of the system.

Figure 4.29 is an abstract representation of the “whole” in the campus as of regards to its compositional structure between landscape and landscape, which breaks down to numerous other elements of different scales and connections, as already covered by this research.

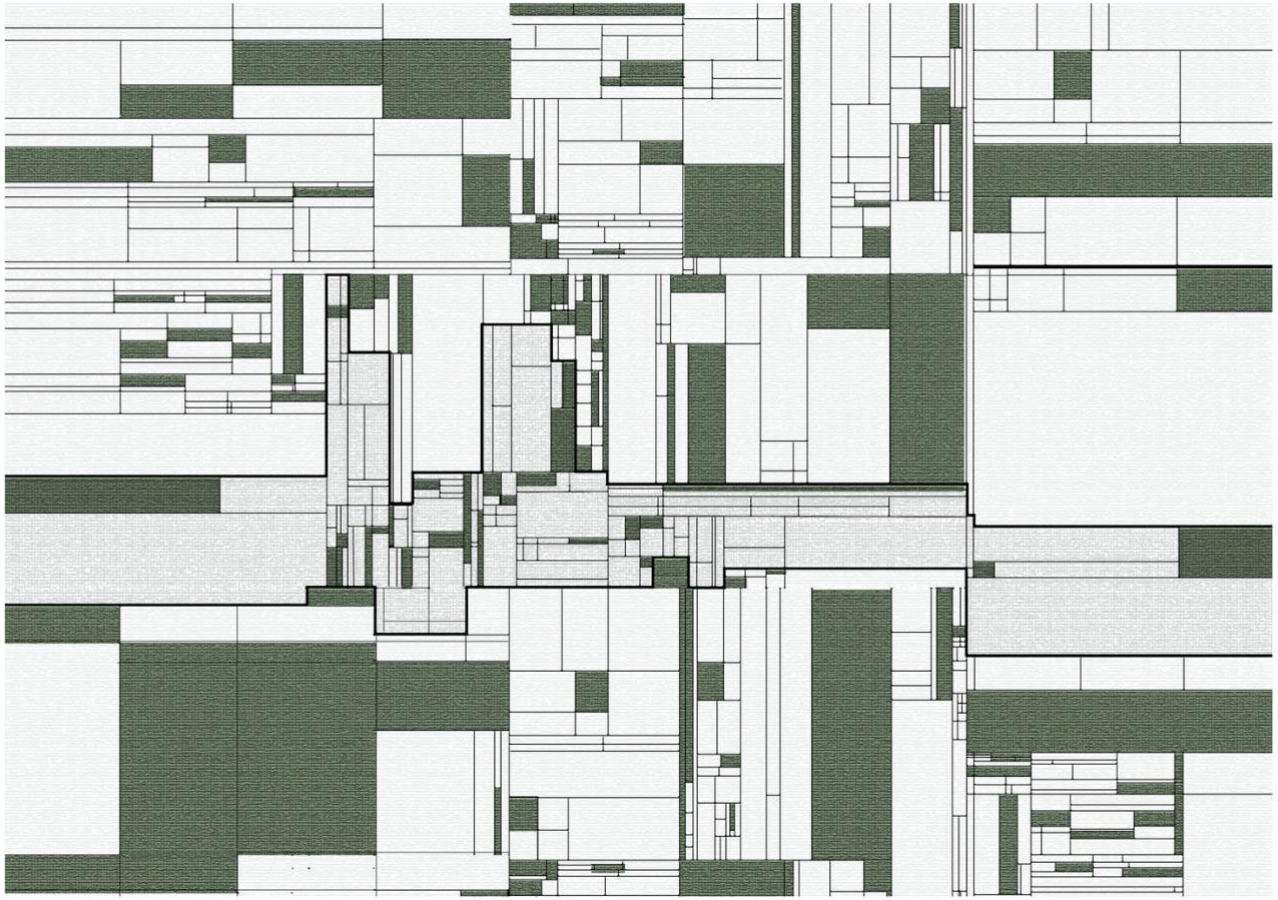


Figure 4.30: An abstract reiteration of the relationship between landscape and hardscape, drawn by the author

CHAPTER 5

CONCLUSION

The main motivation of this research originates from the unique experience that the METU campus offers to its users via the intricacy of a plethora of elements it embodies in its peculiar order, driven by the topological relations between the parts of each and every constituent. In this context, the topological landscape of the METU Campus provides an exemplary of how topological relations generate a successful environment, where nature, the built environment, and the users are in an interrelatedly cohesive state. Topology does not only guide the shaping of a landscape, but it also enables designers and place-makers to grasp an understanding of landscapes' adaptive capacity. For many prominent figures in the field of landscape design, topology has been deemed the future of design.

As such, the objective of this thesis was to study the landscape of the campus in terms of topological design practices. The landscape's relation to architecture, its users, connectivity, and elements are what contribute to the formation of a topological landscape on the campus. As the title of the thesis suggests, METU Forest is the first step toward the creation of such a landscape, for it gives the campus the identity that it holds and mediates the way through the landscape of the main campus. Secondly, the grid provides a framework for bringing together the natural landscape and the users, via the formation of the main spine together with its secondary and tertiary connections characterized by various types of boundaries that instigate a wide range of premeditated and emergent activities. Different permutations of possible interactions between the constituent elements of the METU campus account for a rich variety of uses within open spaces of different characters and sizes. Once the topological ground of the METU campus was established based on the interrelation of its constituents on the larger whole, the need to develop an understanding of how the meshwork of the METU Campus emerges bottom up.

For that, the METU campus was analyzed based on the theoretical approach of rules for generating coherence from complexity on the smallest scale. This approach enabled a systematic analysis through visualization of couplings between spatial elements of the METU campus, focusing by large on the human scale. The overlapping field effects of the elements indicate that proximity is the basis for generating strong topological relations, that enhance human scale in a design. The study has collected photos from the campus, archiving different dynamisms of landscape, starting from building facades to stairs, ramps, pathways, retaining walls, urban furniture, and other landscape structures. The thesis introduces a framework of different scales of the complex interrelations in the landscape of the campus that provide the uniformity of it.

The research of the thesis reveals that METU Campus Landscape is a great example of a topological design; for it provides aesthetic harmony, successful interrelations within itself and the architecture surrounding, and most importantly, can adapt and regenerate to fulfill its habitant's everyday conducts. It is a well-thought-designed landscape, where the naturality of the topography has been the main factor to shape the upcoming design processes of the campus, preserving the originality of its ground. To adopt a topological thought in the design of a campus of such scale, before the term itself had been introduced in the field, requires a deep understanding and a novel intuition about architecture. The architects of the campus have apparently achieved it by having a noticeably clear vision of what they wanted this campus to be and represent.

To sum up, the main contribution of this study is an archive of topological relations between spatial elements of the METU campus on various scales. The relations occur between three different sets, which are landscape, architecture, and users' activities. To that end, this research develops a perspective of designing space with topological thinking on the smallest scale perceivable by the user. However, there are several limitations that this study has as regards the identification of topological relations of a naturally emerging and designed space. Firstly, the addressed couplings are only a snapshot of a much bigger picture and further research has the potential to identify

other examples of relations in the rich complexity of the METU campus. Secondly, further analysis of the METU campus as a topological ground can reveal the possibility of developing tools that assess the quality of any topological landscape or generate codes to create a successful topological meshwork by design, to be further concretized with respect to the local context of the target area.

REFERENCES

Akman, S. (2016). *Conserving And Managing Modern Campus Heritage: "Alley" as The Spine of METU Campus, Ankara.*

Alexander, C. (1973). *Notes on the Synthesis of Form.* Cambridge, Massachusetts: Harvard University Press.

Alexander, C. (2002). *The Nature of Order.* Berkeley, California: The Center for Environmental Structure.

Alexander, C. (1965). *A city is Not a Tree.*

Brandt, J., & Vejre, H. (2004). Multifunctional landscapes - motives, concepts and perceptions. In J. Brandt, & H. Vejre (Eds.), *Multifunctional Landscapes: Volume 1 Theory, Values and History.* WIT Press. Advances in Ecological Sciences Vol. 1

Cengizkan, A. (2007). METU JFA. An Interview with George Dodds, *On the Quality of METU Faculty of Architecture Building and the Changing Circumstances in Publishing.*

Clarke, K. C., & Romero, B. E. (2017). On the topology of topography: a review. In *Cartography and Geographic Information Science* (Vol. 44, Issue 3, pp. 271–282). Taylor and Francis Inc. https://doi.org/10.1080/15230406.2016.1164625

Cosgrove, D. (2013) 'Landscape: ecology and semiosis', in Palang H., and Fry, G. (eds) Landscape Interfaces: Cultural Heritage in Changing Landscapes, Dordrecht: Kluwer Academic Publishers.

Çalışkan, O., "Urban coherence: a morphological definition," *URBAN MORPHOLOGY*, pp. 123–141, 2017, Available: https://hdl.handle.net/11511/54080.

Doherty, G., & Waldheim, C. (2015). *Is Landscape. . . ?: Essays on the Identity of Landscape* (1st ed.). Routledge.

Foley, D., & Tynan, E. (2012). The relationship between landscape representation and landscape design. In *Journal of Architecture* (Vol. 17, Issue 1, pp. 119–129). https://doi.org/10.1080/13602365.2012.659916

Bütüner, F, B. (2019). Lost Common Grounds: Reflections on Ankara's Landscape. IFLA World Congress.

Bütüner, F, B. (2019). Land Art: A Creative Ground for Site Analysis. ECLAS 2019: Lessons from the Past, Visions for the Future.

Freytag, A. (2018). Topology and Phenomenology in Landscape Architecture. Landschaftsarchitekturtheorie. Aktuelle Zugänge, Perspektiven Und Positionen, Ed by Karsten Berr. https://doi.org/10.1007/978-3-658-18838-2_11

Freytag, A. (2013). Landscript 3: Topology. Topical Thoughts on the Contemporary Landscape

Gehl, J., & Koch, J. (1987). *Life between buildings: Using public space.* New York: Van Nostrand Reinhold.

Girot, C. (2012). *Topologie / Topology*. gta Verlag / eth Zürich.

Girot, C. (2018). Immanent Landscapes. *Critique d'art*. https://doi.org/10.4000/critiquedart.25605

Girot, C, (2012). Landscapology. Learning to Landscape the City. *Journal of Landscape Architecture*, https://doi.org/10.1080/18626033.2012.693783

Girot, C. & Imhof, D. (2016). *Thinking the Contemporary Landscape* (Illustrated ed.). Princeton Architectural Press.

Girot, C. & Kirchengast, A. (2022). *Landscape Analogue: About Material Culture and Idealism (Landscript, 6)* (1st ed.). JOVIS.

Girot, C. (2003). Frédéric Christophe Girot. *Studies in the History of Gardens & Designed Landscapes*, *23*(2), 141–151. https://doi.org/10.1080/14601176.2003.10435289

Gusić, I. (1998). A Topology on Lattice Ordered Groups. *Proceedings of the American Mathematical Society*, *126*(9), 2593–2597. http://www.jstor.org/stable/119178

Haubold, J. (2020). *Greece and Mesopotamia (The W. B. Stanford Memorial Lectures)* (Illustrated ed.). Cambridge University Press. https://doi.org/10.1111/j.1931-0846.2015.12119.

Higgins, A. (2014). A New Look at a Fifties Landscape. *The Washington Post.*

Jabi, W., Lannon, S., Wardhana, N. M., Aish, R., & Chatzivasileiadi, A. (2018). *Topologic: tools to explore architectural topology.* https://www.researchgate.net/publication/327891111

Jackson, B., (1984). *Discovering the Vernacular Landscape.* Yale University Press.

Kantor, J. M. (2005). A tale of bridges: Topology and architecture. . In *Nexus Network Journal* (Vol. 7, Issue 2, pp. 13–21). https://doi.org/10.1007/s00004-005-0020-4

Keith C. Clarke & Boleslo E. Romero (2017) On the topology of topography: a review, Cartography and Geographic Information Science, 44:3, 271-282, DOI: 10.1080/15230406.2016.1164625

Kurdaş, Kemal. (2004) *ODTÜ Yıllarım, "Bir Hizmetin Hikayesi."* 2nd Ed. Ankara: METU Press

Landscript 03: Topology: Topical Thoughts on the Contemporary Landscape. (2013). Jovis.

Livesey, G. (2016). Emerging Landscapes: Between Representation and Production. *Geographical Review*, *106*(1), e13–e15.

Marshall S. (2012) *Planning, Design, and the Complexity of Cities.* In: Portugali J., Meyer H., Stolk E., Tan E. (eds) Complexity Theories of Cities Have Come of Age. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-24544-2_11

Mehaffy, M. W. (2010). From Pattern Languages To Generative Codes: A Report On The Work Of Christopher Alexander And Colleagues & Its Application To The Regeneration Of Traditional Settlements. *New Architecture and Urbanism: Development of Indian Traditions,* 192–200. https://doi.org/10.5848/csp.1892.00027

Mitchell, W., J., T, 'Introduction', in *Landscape and Power,* edited by W.J.T. Mitchell (Chicago & London: The University of Chicago Press, 1994)

Morgan, L. (2016). The Legibility of Landscape: From Fascism to Foucault. In *The Monster in the Garden: The Grotesque and the Gigantic in Renaissance Landscape Design* (pp. 17–46). University of Pennsylvania Press. http://www.jstor.org/stable/j.ctt16xwc9b.4

Myers, W. L., Kong, N., & Patil, G. P. (2005). Topological approaches to terrain in ecological landscape mapping. *Community Ecology*, *6*(2), 191–201. http://www.jstor.org/stable/90002599

Nelson, M. C., & Strawhacker, C. (Eds.). (2011). *Movement, Connectivity, and Landscape Change in the Ancient Southwest*. University Press of Colorado. http://www.jstor.org/stable/j.ctt46nvkv

Ode, Å., Hagerhall, C. M., & Sang, N. (2010). Analysing visual landscape complexity: Theory and application. *Landscape Research*, *35*(1), 111–131 https://doi.org/10.1080/01426390903414935
Projeler: 1 Yarışma Projeleri 2000-2008, edited by Savaş, A.

Kenneth Olwig, 'The "Actual Landscape," or Actual Landscapes', in *Landscape Theory*, 147

"Orta Doğu Teknik Üniversitesi Ankara Yerleşkesi Mekânsal Strateji ve Tasarım Kılavuzu. (n.d.).

Re-Forestation Programme of the Middle East Technical University. (n.d.).

Rose, M., & Wylie, J. (2006). Animating Landscape. *Environment and Planning D: Society and Space*, *24*(4), 475–479. https://doi.org/10.1068/d2404ed

Salingaros, N. A. (2000). Complexity and Urban Coherence. Journal of Urban Design, 5(3), 291–316. https://doi.org/10.1080/713683969

Sargın, G. A., (2008). Modernleşme Projesinin Bir İmgelemi Olarak Bozkır Deneyimi: ODTÜ Yerleşkesinin Çevresel Tarihine Giriş. *ODTÜ Mimari*

Sargın, G. A., & Savaş, A. (2016). 'A University is a society': an environmental history of the METU 'campus.' *The Journal of Architecture*, *21*(4), 602–629. https://doi.org/10.1080/13602365.2016.1192429

Savaş, Ayşen, Bengisu Derebaşı, İpek Gürsel Dino, Sezin Sarıca, F. Serra İnan, and Şahin Akın, eds. (2018). '"Research and Conservation Planning for the METU Faculty of Architecture Building By Altuğ-Behruz Çinici , Ankara, Turkey.' Keeping *It Modern Project Report, Getty Foundation*. https://www.getty.edu/foundation/pdfs/kim/metu_arch_res_cons_plan.pdf.

Savaş, Ayşen. "METU Campus." *Brownbook Magazine*, 2018, 71–85.

Savaş, Ayşen. "The METU Campus Documented V: Representing Itself." *METU Journal of Architecture* 57, no. May (2019): 285–95.

Seamon, D. (2014). “Romantic Geography: In Search of the Sublime Landscape” by Yi-Fu Tuan. *Environmental Philosophy*, *11*(2), 369–372. https://doi.org/10.5840/envirophil201411213

Tanyeli, U. (1999) "Improvisation: Mimarlıkta Doğaçlama ve Behruz Çinici" Boyut Kitapları

Thornton, K., (2014). Thinking the contemporary landscape - Positions & oppositions. *Journal of Landscape Architecture*, *9*(1), 88. https://doi.org/10.1080/18626033.2014.898875

Topology. (1980). *Topology*, *19*(1), 99. https://doi.org/10.1016/0040-9383(80)90035-x

“The First of ODTÜ | ODTÜ’nün 60.Yılı.” Accessed March 14, 2022 Retrieved from https://60yil.metu.edu.tr/en/firsts-metu.

Tuan, Y. (1981). *Landscapes of Fear* (Reprint ed.). University of Minnesota Press

Tuan, Y. (2014). *Romantic Geography: In Search of the Sublime Landscape* (1st ed.). University of Wisconsin Press.

Venturi, R., & Museum of Modern Art (New York, N.Y.),. (1966). *Complexity and contradiction in architecture,* New York: Museum of Modern Art.

Venturi, R., The Obligation Toward the Difficult Whole, in: *Complexity and Contradiction in architecture*, The Museum of Modern Art Papers on Architecture, 1966, 2nd. ed. 1977, p.88-105.

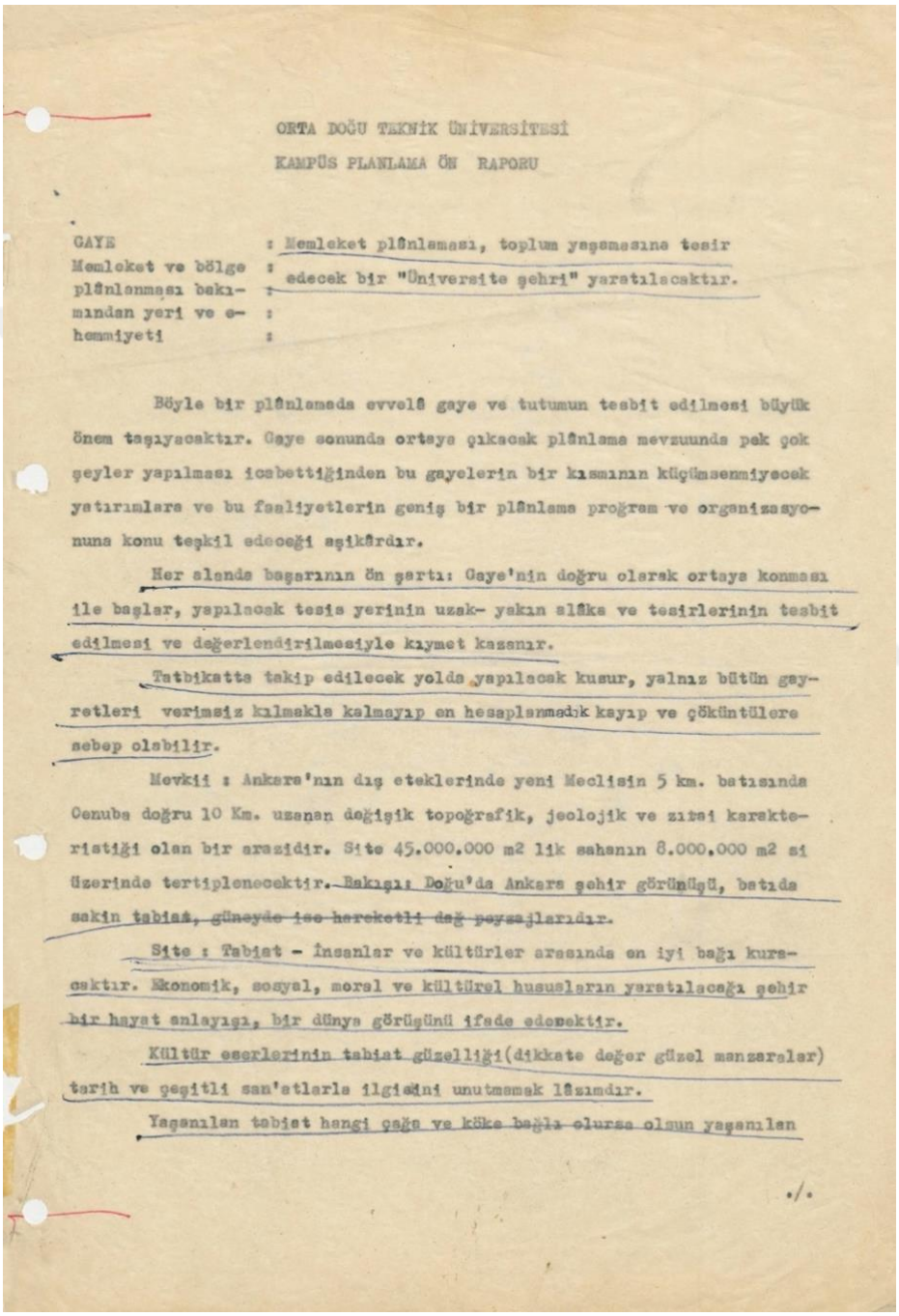
Waldheim, C. (2014). Introduction: Landscape as architecture. In *Studies in the History of Gardens and Designed Landscapes* (Vol. 34, Issue 3, pp. 187–191). Routledge. https://doi.org/10.1080/14601176.2014.893140

Waldheim, C. (2016). Urban Crisis and the Origins of Landscape. In *Landscape as Urbanism: A General Theory* (pp. 88–104). Princeton University Press. https://doi.org/10.2307/j.ctvcszzn2.10

Yavuz, A., Landscaping of the METU Campus, local report. (n.d.).

APPENDICES

A. Middle East Technical University (Information)



ORTA DOĞU TEKNİK ÜNİVERSİTESİ
KAMPÜS PLANLAMA ÖN RAPORU

GAYE : Memleket plânlaması, toplum yaşamasına tesir
Memleket ve bölge plânlanması bakımından yeri ve ehemmiyeti : edecek bir "Üniversite şehri" yaratılacaktır.

Böyle bir plânlamada evvelâ gaye ve tutumun tesbit edilmesi büyük önem taşıyacaktır. Gaye sonunda ortaya çıkacak plânlama mevzuunda pek çok şeyler yapılması icabettiğinden bu gayelerin bir kısmının küçümsenmiyecek yatırımlara ve bu faaliyetlerin geniş bir plânlama proğram ve organizasyonuna konu teşkil edeceği aşikârdır.

Her işlerde başarının ön şartı: Gaye'nin doğru olarak ortaya konması ile başlar, yapılacak tesis yerinin uzak- yakın alâka ve tesirlerinin tesbit edilmesi ve değerlendirilmesiyle kıymet kazanır.

Tatbikatta takip edilecek yolda yapılacak kusur, yalnız bütün gayretleri verimsiz kılmakla kalmayıp en hesaplanmadık kayıp ve çöküntülere sebep olabilir.

Mevkii : Ankara'nın dış eteklerinde yeni Meclisin 5 km. batısında Cenuba doğru 10 Km. uzanan değişik topoğrafik, jeolojik ve zirai karakteristiği olan bir arazidir. Site 45.000.000 m2 lik sahanın 8.000.000 m2 si üzerinde tertiplenecektir. Bakışı: Doğu'da Ankara şehir görünüşü, batıda sakin tabiat, güneyde ise hareketli dağ peyzajlarıdır.

Site : Tabiat - İnsanlar ve kültürler arasında en iyi bağı kurmaktır. Ekonomik, sosyal, moral ve kültürel hususların yaratılacağı şehir bir hayat anlayışı, bir dünya görüşünü ifade edecektir.

Kültür eserlerinin tabiat güzelliği(dikkate değer güzel manzaralar) tarih ve çeşitli san'atlarla ilgisini unutmamak lâzımdır.

Yaşanılan tabiat hangi çağa ve köke bağlı olursa olsun yaşanılan

./.

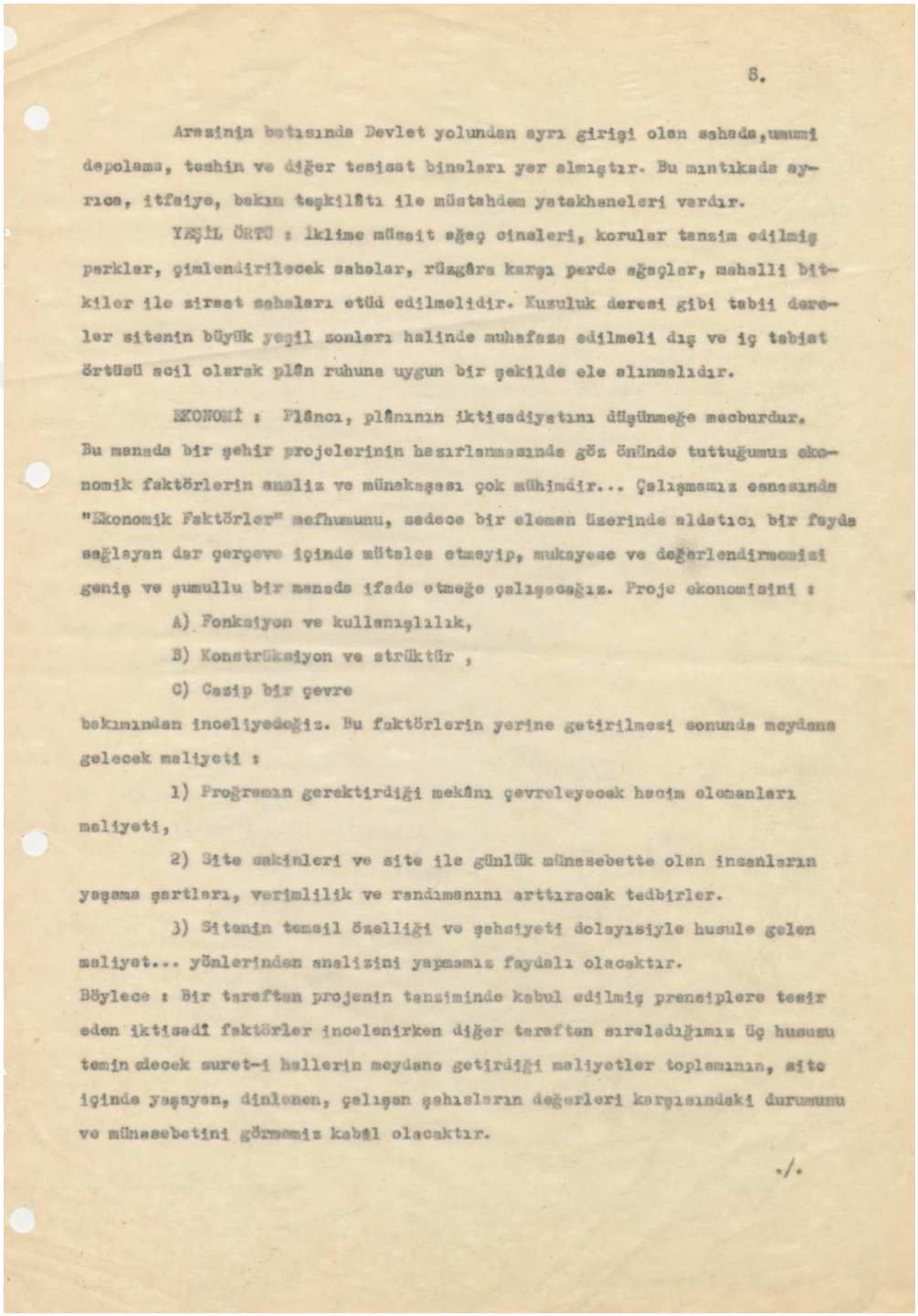
SALT Research Archive

B. Site plan of METU Campus



SALT Research Archive

C. Reports about METU Campus



6.

Arazinin batısında Devlet yolundan ayrı girişi olan sahada,umumi depolama, teshin ve diğer tesisat binaları yer almıştır. Bu mıntıkada ayrıca, itfaiye, bakım teşkilâtı ile müstahdem yatakhaneleri vardır.

YEŞİL ÖRTÜ : İklime müsait ağaç cinsleri, korular tanzim edilmiş parklar, çimlendirilecek sahalar, rüzgâra karşı perde ağaçlar, mahalli bitkiler ile ziraat sahaları etüd edilmelidir. Kuzuluk deresi gibi tabii dereler sitenin büyük yeşil zonları halinde muhafaza edilmeli dış ve iç tabiat örtüsü asil olarak plân ruhuna uygun bir şekilde ele alınmalıdır.

EKONOMİ : Plâncı, plânının iktisadiyatını düşünmeğe mecburdur. Bu manada bir şehir projelerinin hazırlanmasında göz önünde tuttuğumuz ekonomik faktörlerin analiz ve münakaşası çok mühimdir... Çalışmamız esnasında "Ekonomik Faktörler" mefhumunu, sadece bir elemen üzerinde aldatıcı bir fayda sağlayan dar çerçeve içinde mütalea etmeyip, mukayese ve değerlendirmemizi geniş ve şumullu bir manada ifade etmeğe çalışacağız. Proje ekonomisini :

A) Fonksiyon ve kullanışlılık,

B) Konstrüksiyon ve strüktür ,

C) Cazip bir çevre

bakımından inceliyeceğiz. Bu faktörlerin yerine getirilmesi sonunda meydana gelecek maliyeti :

1) Proğreman gerektirdiği mekânı çevreleyecek hacim elemanları maliyeti,

2) Site sakinleri ve site ile günlük münasebette olan insanların yaşama şartları, verimlilik ve randımanını arttıracak tedbirler.

3) Sitenin temsil özelliği ve şahsiyeti dolayısiyle husule gelen maliyet... yönlerinden analizini yapmamız faydalı olacaktır.

Böylece : Bir taraftan projenin tanziminde kabul edilmiş prensiplere tesir eden iktisadî faktörler incelenirken diğer taraftan sıraladığımız üç hususu temin edecek suret-i hallerin meydana getirdiği maliyetler toplamının, site içinde yaşayan, dinlenen, çalışan şahısların değerleri karşısındaki durumunu ve münasebetini görmemiz kabil olacaktır.

./.

SALT Research Archive