

QUESTIONING THE SPATIAL BOUNDARIES IN SUBURBAN
RESIDENTIAL SITES IN ANKARA: THE CASE OF KORU NEIGHBORHOOD

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NEIGHBORHOOD**

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ABSTRACT

QUESTIONING THE SPATIAL BOUNDARIES IN SUBURBAN RESIDENTIAL SITES IN ANKARA: THE CASE OF KORU NEIGHBORHOOD

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As in many other professional disciplines, ‘spatial boundaries’ has been one of the current critically important research topics in the field of urban design. With the fast increase in population, urban areas which have rapidly sprawled, have brought increasingly our attention towards the importance of spatial boundaries in cities. Especially residential site borders have recently become a basic research topic since they have started to become more and more dominant urban design elements in urban areas.

'Spatial boundaries' perform various important functions. However, in urban areas, it has become more and more ambiguous how far spatial borders (for example, as the borders of residential sites) successfully and effectively fulfill these functions. Being located at the intersection of public and private spheres, and functioning to restrict visual and physical permeability, they affect the quality of urban areas.

The major assumptions of this thesis lie on the residential border’s inability to fulfill their functions and their negative impact on being visually and physically impermeable. The assumptions of this research are tested in a prominent middle-class suburb in Ankara, the capital city of Turkey, through the direct observation, documenting and mapping of spatial boundaries of the 52 residential sites in Koru Neighborhood. This research examines the height, material, and visual and physical

permeabilities of residential site boundaries, and maps them through color codes in order to understand their effects on urban areas.

The research findings reveal that the spatial boundaries partly fulfill the functions of safety and security, giving identity, providing privacy, dualism, determining psychosocial behavior, dividing and providing order functions, and features in this neighborhood. It studies the visual and physical permeability level of residential site borders under the urban design principles, and the research findings reveal that impermeable borders negatively affect character, continuity, ease of movement, and access to green areas actively and passively. To convert these negative effects to positive ones, and to benefit from advantages of permeable borders that are rarely utilized, this thesis suggests that the boundaries, which are impossible to vanish, should be low, visually permeable or semi-permeable, especially in high-rise apartment building's sites. It also proposes that the spatial borders should be physically permeable or semi-permeable for pedestrians, and be made of evergreen plant material. If this is not desired by users, this research suggests that, at least, evergreen plant material should be used as spatial boundaries to support public health by letting people access green passively.

Keywords: Boundaries, Spatial boundaries, Suburban residential sites, Permeability, Urban design

ÖZ

ANKARA BANLİYÖLERİNDEKİ KONUT ALANLARININ MEKÂNSAL SINIRLARININ İNCELENMESİ: KORU MAHALLESİ ÖRNEĞİ

Bilir, Zeliha Irmak
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Diğer birçok profesyonel disiplinde olduğu gibi, 'mekânsal sınırlar', kentsel tasarım alanında da kritik öneme sahip güncel araştırma konularından biridir. Nüfusun hızla artmasıyla birlikte, hızla yayılan kentsel alanlar, dikkatimizi şehirlerdeki mekânsal sınırların önemine daha fazla çekmiştir. Özellikle yerleşim alanı sınırları son zamanlarda temel bir araştırma konusu haline gelmiştir, çünkü kentsel alanlarda giderek daha baskın kentsel tasarım öğeleri haline gelmeye başlamışlardır.

'Mekânsal sınırlar' çeşitli önemli işlevleri yerine getirir. Bununla birlikte, kentsel alanlarda, mekânsal sınırların (örneğin, yerleşim alanlarının sınırları gibi) bu işlevleri ne kadar başarılı ve etkili bir şekilde yerine getirdiği giderek daha belirsiz hale gelmiştir. Kamusal ve özel alanların kesişme noktasında yer alan ve görsel ve fiziksel geçirgenliği belirleme işlevi gören sınırlar, kentsel alanların kalitesini etkiler.

Tezin temel varsayımları, yerleşim sınırının işlevlerini yerine getirememesi ve görsel ve fiziksel olarak geçirimsiz olan sınırların kentteki mekânları olumsuz etkilemesidir. Bu araştırmanın varsayımları, Türkiye'nin başkenti Ankara'da önde gelen bir orta sınıf banliyösü olan Koru Mahallesi'ndeki 52 yerleşim alanının mekânsal sınırlarının doğrudan gözlemlenmesi, belgelenmesi ve haritalanması yoluyla test edilmiştir. Bu araştırma, yerleşim alanı sınırlarının yüksekliğini,

malzemesini, görsel ve fiziksel geçirgenliklerini incelemekte ve kentsel alanlar üzerindeki etkilerini anlamak için renk kodlarıyla haritalamaktadır.

Araştırma bulguları, konut sitelerinin sınırların güvenlik sağlama işlevlerini kısmen yerine getirdiğini, kimlik kazandırmak konusunda zayıf kaldığını, gizlilik sağladığını, dualizm sağladığını, psiko-sosyal davranışı belirlediğini, mülkiyet gösterdiğini, hiyerarşi belirlediğini, bölme işlevini ve düzeni sağladığını, bağlantı kurma ve etkileşim yeri olma özelliklerini ise yerine getiremediğini ortaya koymaktadır. Araştırma, yerleşim alanı sınırlarının görsel ve fiziksel geçirgenlik düzeylerini kentsel tasarım ilkeleri altında inceler ve araştırma bulguları, geçirimsiz sınırların karakter, süreklilik, hareket kolaylığı ve yeşil alanlara erişimi aktif ve pasif olarak olumsuz etkilediğini ortaya koymaktadır. Bu olumsuz etkileri olumlu etkilere dönüştürmek geçirgen sınırların, nadiren ve kullanılan avantajlarından yararlanmak için, bu tez, onlarsız bir hayatın mümkün olmadığı sınırların, özellikle yüksek katlı apartman sitelerinde düşük yükseklikte, görsel olarak geçirgen ya da yarı geçirgen olarak tasarlanıp uygulanmalarını önerir. Ayrıca, uzamsal sınırların yayalar için fiziksel olarak geçirgen veya yarı geçirgen olmasını ve herdem yeşil bitki materyalden yapılmasını önermektedir. Eğer bu sınırlar, kullanıcılar tarafından çeşitli sebeplerden dolayı istenmezse, bu araştırma, en azından insanların pasif olarak yeşile erişmesine izin vererek halk sağlığını desteklemek için herdem yeşil bitki materyallerinin mekânsal sınırlar olarak kullanılması gerektiğini önermektedir.

Anahtar Kelimeler: Sınırlar, Mekânsal Sınırlar, Banliyö Konut Alanları, Geçirimsizlik, Kentsel Tasarım

To my family...

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CHAPTER 1

INTRODUCTION

The dramatic rise in the amount of immigration from rural areas to urban ones and, as a result, with the increase of urban population, the number and importance of residential buildings and sites have risen. Such a change have had an impact on urban life and culture, which shape urban forms. Among many other effects two of the most visible ones are urban fear and social segregation. This apparent segregation, which also results in alienation, can be considered as an outcome of spatial boundaries. Alienation between the different social communities has inevitably created spatial segregation in every scale of the urban areas, from districts to small units in the streetscape. The boundaries of residential sites are one of the most visible evidence of this segregation, and the core concern of this study is to analyze the borders about their functions and features and their impact on the life in urban areas.

The subchapters of this introduction encompass the definition of the problem of the study, research questions related to the problem, assumptions, the aim and importance of the study, limitations, and the method and structure of the study.

1.1 Problem Definition

The notion of “boundary” exists in every context in the universe, and it is an obvious fact in every physical object or space. Though this notion is mostly associated with physical borders, it is not uncommon to realize and hear about non-physical boundaries. Physical or nonphysical boundaries are existent in cities on

every scale and can easily be observed socially and spatially. From the beginning of time, boundaries defined spaces and made them “places”. For defining their territory, the spaces need to show their boundaries. When the boundaries get physical and strict, they emphasize differentiation. While some buildings (which are used for critical jobs like administrative, governmental, and ministry) may need rigid boundaries for security, today, residential areas have also gained this much or, in some cases, more emphasized borders. The overemphasized border reality, like very high, impermeable walls, in residential areas is observable both in the city center and suburban, and this border’s number and invasion increases every day. With the sprawl of urban areas, suburban districts with highly residential purposes became an exact instance for this invasion. These rigid borders divide, decompose and segregate the places, and with these actions, they make people feel more alienated to and deepen social segregation between different social classes or even segregate people who are in the same class, so they create urban fear and make people afraid of strangers. The invasion of physical borders not only segregates socially and physically, but they also block physical and visual permeability, which may cause mostly negative effects on the life in urban areas. The principles of urban design, such as legibility, character, diversity, continuity and enclosure, ease of movement, adaptability, and public quality can also profoundly affect by residential site borders. Furthermore, with the decrease of urban sprawl and residential sites worldwide, this change is going to continue to affect and shape urban areas.

Residential site borders are physical elements which are on the outer edge of a residential site. They can be walls, fences, plant row or other physical elements and surround the boundaries of the site. As residential site borders have turned out to be a part of the landscape and they are designed and built generally after the construction of the architectural building, their design and effect to the public sphere are generally undervalued because of financial reasons. The borders are located on the line between the public sphere and the private sphere, and this makes

these borders unique about their existence. These borders mostly affect the public spaces more than the architecture of buildings with their height and material because of their close location to the public streets or squares; however, their effect on the public sphere and urban areas is not limited to that. They can visually and physically block the things behind them. Especially for low stored houses, the borders of these houses' gardens are much more visible than the house itself.

Visual permeability level of borders can block views, can partly allow for view, or can totally allow "the others" to see what is in. All these permeability levels create a different kind of visual experience and affect the perception about the site. The visual access to the garden of residential sites can increase people's moods and can give a more preferable experience of sight. Fully impermeable borders can be a loss of opportunity for achieving these.

With rapid urbanization, it becomes difficult to access green and nature for people, and especially in urban areas, they cannot benefit enough from the advantages of green areas. Not only is accessing green areas physically beneficial, but also passive visual access also has an effect on stress management and anxiety levels.

According to Akpınar and Cankurt (2015), studies which show the positive correlation between green areas and decreased stress (Wells and Evans 2003, Stigsdotter 2004, Nielsen and Hansen 2007, Laforzezza et al. 2009, van den Berg et al. 2010, Ward Thompson et al. 2012), decrease of psychosocial and physiologic illnesses related with stress (Morita et al. 2007, Francis et al. 2012, Adevi and Lieberg 2012). Moreover, there is a positive correlation between the amount of green areas and the decrease of depression (Bodin and Hartig 2003, McCaffrey 2007, Maas et al. 2009, Berman et al. 2012), anxiety (Bodin and Hartig 2003, Maas et al. 2009, Mackay and Neill 2010), anger and aggression (Ulrich 1979, Kuo and Sullivan 2001, Bodin and Hartig 2003). Green areas increase physiological well-being (Herzog and Strevey 2008, Park et al. 2008) and health and quality of life

(Richardson and Mitchell 2010, van Dillen et al. 2011, McFarland et al. 2008). In addition to these, there is a positive relation between green areas, and physical activities, indicating that these areas encourage physical activities (Akpınar and Cankurt, 2015).

Kaplan (1993) portrayed that workers with workstation views that included green elements were more satisfied at work and had more patience, less frustration, increased enthusiasm for work and fewer health problems. Chang and Chen (2005) found that not having nature views or indoor plants are associated with higher levels of tension and anxiety among office workers. (“Mental Health,” 2018) These studies show not only physical access but also viewing green has a healing effect on people. As mentioned before, high and impermeable borders limit such a visual access to green, which is a considerable problem in new urban life style.

The physical permeability level of a residential site border affects the continuity of a route and ease of movement. The prohibition of transition through residential sites makes people walk a longer route and causes waste of time. Besides, with the decline in the amount of publicly open green spaces in urban areas, today, people cannot access, use and experience green areas; on the other hand most of the especially high-rise residential sites have unused green spaces in their territory. If the site is physically impermeable (if the strangers/non-residents of the site are not allowed to enter the site freely), these green areas are only for the use of residents, and this can be a loss of opportunity for people who lacks access to green spaces. This is not applicable to every site, but this is an opportunity loss for supporting public health.

Overall, the invasion of residential site borders, their effect on social and spatial segregation, their lack of fulfilling their functions, their effect on urban areas and the public sphere, and their permeability levels are main problems of this study.

1.2 Aim of the Study and Research Questions

The problems that have been stated so far in this chapter have risen the following questions and sub-questions:

Boundaries and physical borders come from the beginning of history because of the nature of every object and existence and they have various functions and features such as providing safety and security, identity, privacy, dualism, order, connection, interaction and more.

- Do the boundaries and physical borders fulfill the boundary's features and functions in today's residential sites?
- How do their visual and physical permeability level affect urban areas?

The sub-questions related to these two research questions are;

- What material is used the most, and what is the dominant height of borders?
- Does material and height choice affect the visual and physical permeability of borders?

Today, physical borders occupy residential sites and neighborhoods more and more, and they support social and physical segregation. For obstructing this invasion, it is necessary to investigate the borders, their meaning, features, and functions. The study aims to understand residential site borders and their effects on urban areas as the boundary concept is multi-scalar. The assumptions related to these are;

1. Residential borders do not fulfill their existence features and functions.

Boundaries have many functions (see Chapter 2.1.3); however, not all of them fulfill these functions because they are mostly designed individually for each plot

or each single residential site without considering a streetscape or a neighborhood as a whole.

2. The rigid residential borders affect urban areas negatively by being visually and physically impermeable.

The aim of the study is testing the correctness of these assumptions and suggesting solutions for them where/if applicable. Moreover, another purpose of this thesis is to see if residential borders dominate neighborhoods and if so, propose a more efficient way of using them in design guidelines. While there are studies on physical boundaries in urban design-related disciplines, this study's importance is to focus on a whole suburban neighborhood for analyzing residential site borders and searching the boundaries spatially in terms of urban design principles.

CHAPTER 2

THE CONCEPT OF BOUNDARY AND ITS FUNCTIONS AND FEATURES IN URBAN CONTEXT

In this chapter, starting from the meaning of boundaries, their emergence types, features and functions, the concept of boundary in the history of cities is revisited, their relation to segregation and its reflection to urban life are elaborated respectively. Residential area boundaries are searched in urban design context and their place in different urban design principles is discussed. In the last sub-heading, the borders in residential sites, their functions and features and three main parameters to understand them are designated.

2.1 The Meaning of Boundary

Boundary studies is a very significant subject for various disciplines such as politics, psychology, philosophy, sociology, geography, architecture and urban studies etc. In this chapter, the meaning of boundary is defined in various contexts and disciplines. Starting from its etymology and dictionary meaning, its emergence reasons and various boundary types and functions and features of physical boundaries are reviewed.

The word “boundary”, is etymologically coined from Latin words “bodina” or “bonna” origin which means limit, border. Also, the root “bon” means “limit” in celtic languages (Terrier, n.d., p. 2).

In its etimological definition, a boundary is “*that which indicates the limits of anything,*” in 1620s, from ***bound*** + ***-ary***. Strictly, a visible mark indicating a dividing line, a bound being the limit or furthest point of extension of any one thing. “(“Boundary”, n.d.).

Today, the word boundary is used not only for concrete, visible and tangible borders but also for various meanings that refers to more abstract, intangible and notional meanings in different fields. Before diving deep into many aspects of boundaries, it is essential to know some commonly cited dictionary meanings. According to *Oxford Dictionary*, it is;

1. A line which marks the limits of an area; a dividing line.
2. A limit of something abstract, especially a subject or sphere of activity (“Boundary”, n.d.).

And according to Cambridge Dictionary a boundary is;

- “1.a real or imagined line that marks the edge or limit of something.
2. the limit of a subject or principle (“Boundary”, n.d.).

The word limit, edge, border, frontier can be listed as some of the synonyms of the word boundary. According to Hornby (1997), all these have the meaning of a line or space which spares a territory from another. Boundary is a line that limits the borders. Boundaries exist in every stage and scale of human experience. Because life always requires boundaries, protection systems and places where the relationships are identified with outside (Mumcu Uçar, 2005, p. 4-5).

There are various boundaries and types of boundaries in various disciplines.

According to Parker (2006) boundaries have five sets which are geographic, politics, demographics, cultural and economic boundaries. The subcategories of geographic boundaries’ are topographic features, physical character, climate, flora

and fauna, and natural resources. Political, administrative and military subcategories are related to political boundaries. Demographic boundaries include ethnicity, population density, health, and gender boundary subcategories. In addition, cultural boundaries have linguistic, religious, material and cultural subcategories. What is more, extraction of raw materials, transshipment of commodities, production of finish products, agricultural production are the subcategories of economic boundaries (Erkan, 2018, p. 18).

According to Ataol (2013), there are visible/physical boundaries and invisible/physio-social boundaries. Natural and unnatural boundaries are two elements under visible boundaries. While natural boundaries are topographical formations, unnatural boundaries are human-made and they can be permeable, semi-permeable and impermeable/strict boundaries (Ataol, 2013, p. 17).

These examples show that everything in nature has boundaries. Even with a close examination of human body, it can be easily noticed that skin is a kind of boundary. Also a room anyone stand has walls as boundaries, the house he/she lives has boundaries, the neighborhood, the district, the city, the region or also the country has boundary lines. Even the planet Earth has its earth and atmospheric boundaries.

If people don't know the limits and boundaries of something, they tend to define it as "space, infinite and unlimited". (Mumcu Uçar, 2006, p. 5)

2.1.1 Emergence of Boundaries

Boundaries have lots of different functions; however, the need for boundaries comes from the need for safety. The history of a need for safety is as old as the history of humankind because there have always been something for people to

protect themselves from. For instance, in early ages, weather conditions and wild animals were a threat for people and these factors steered people to have some boundaries.

According to Maslow (1943), who put forward a still unchallenged theory hierarchy of human needs, human motivation is driven by five sets of goals which are called basic needs (Figure 2.11). These are briefly and respectively physiological needs, safety, love, esteem, and self-actualization needs. These basic needs are arranged in a hierarchy of prepotency. Although there can be a few exceptions in these basic needs order, the importance of safety cannot be ignored in any period of human existence. If physiological needs such as the need for water, air, food, and sleep are well gratified, safety need emerges, and among the many psychological needs of people, Maslow locates the need for safety at the very base, indicating the importance of it (Maslow, 1943, p. 18).

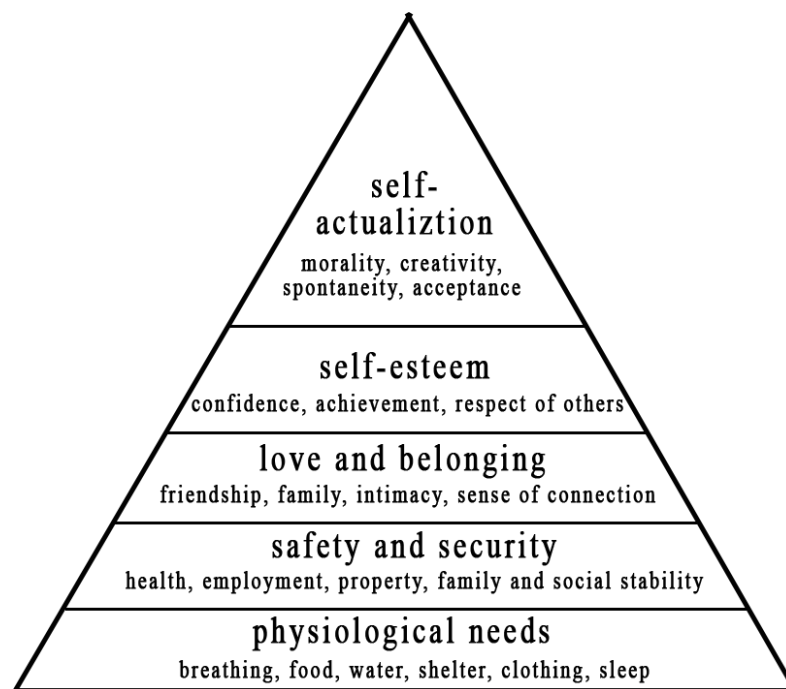


Figure 2.1 Maslow's hierarchy of needs (Clark, 2012)

Moreover, the need for shelter is a physiological need, but the psychological need for safety steers humans to build a shelter. A shelter is a space which is bounded with some materials. It can be easily claimed that safety is one of the most essential needs of human and it is a kind of baseline for other needs and it allows to meet higher needs in the Maslow's Hierarchy of Needs such as love, esteem, and self-actualization.

Mattern (1997) stated that humans, after being a hunter and collector, started to tame animals and to do agricultural activities, and this changing economy based on possessions motivated people to have elements of boundaries, which served for both preventing animals to run away and showing ownership of agricultural land (Uluer, 1997, p. 3). However, these reasons to draw boundaries also related to the safety of goods.

Safety need also required people to live collectively.

The emergence of the first urban settlements or the first towns has four explanatory theories (Bilsel, 2016). One is Gordon Chylde's Hydraulic Theory, which explains the first human settlements that emerged on the fertile lands next to a water source. This theory is related to the physiological needs of human beings. The second theory is the religious theory which stresses the role of religion in the emergence of first towns. According to religious theory, tribal groups agglomerated around sacred places or sacred territories. People used to offer the gods from surplus and ensure their safety and security in that way. The religious theory is related to human's safety need in some way. The third theory is an economic theory that sees the city as a market place. According to economic theory, towns were firstly developed for trade activity. Market places appeared on the cross-roads and these areas developed into towns. The fourth theory is the military theory. This theory claims that a ruling and military class has the policy of organized external war and the ruling class is controlling the surplus. The military theory also shows human's safety need and this need's connective role in social and collective life.

Safety need led people to build city or country walls from the ancient age to 18th century. The walls which can still be observed today, in the 21st century, are architectural evidences of the fact that people have always needed safety.

2.1.2 Types of Boundaries

There are various types of boundaries in different fields. In this part, invisible boundaries and personal space, natural and unnatural boundaries, political boundaries and permeable and impermeable boundaries are reviewed.

2.1.2.1 Invisible boundaries and personal space

Boundaries don't have to define a physical or spatial limit; they can also be invisible or psychological signs. Everything in nature has boundaries even if we don't see the borders all the time. In addition to the human body's boundary "skin", people have some invisible zones with limits which are called personal space. People feel that they strive for their personal space mostly when it is occupied and when they are in an area that is crowded or tight.

Personal space is defined as the area surrounding an individual and a place in which the interactions with other people occur. It is a form of territory but there are no fixed physical reference points; that is the borders can be claimed to be relative. Moreover, this personal area expands and shrinks in different places, next to different people and in different time periods (Little, 1965, p. 237).

“Boundaries define us. They define *what is me* and *what is not me*. A boundary shows me where I end and someone else begins, leading me to a sense of ownership.” (Cloud and Townsend, 1992, p. 27)

Although they are invisible, boundaries orient human life and human interaction in many ways and these are research for psychologists, sociologists, and behavior scientists.

As it is explained in chapter 2.3.1 public and private spheres in urban areas come from people’s personal spaces. People have an instinct to protect their personal spaces and territories.

2.1.2.2 Natural and unnatural boundaries

Natural boundaries are naturally occurring barriers between two areas (“Boundaries and Borders”. n.d.).

According to Brigham (1919, p. 225), there are four commonly recognized kinds of natural boundaries which are mountains and water partings in general; deserts; seas; and rivers. They show infinite diversity, irregularity, and confusion in magnitude and in form and that they offer a limited assortment of sharply defined, unmistakable, and unchanging division.

Unnatural or artificial boundaries are human-made and they are made of natural or unnatural materials. They can be a state’s or a country’s political borders or micro borders in urban areas. As can be understood from these definitions and classifications, borders in residential areas studied in this thesis are unnatural ones.

2.1.2.3 Political boundaries

Not only do cities have their walls, but also countries have some physical boundaries which are called “borders”.

Borders define and divide where one governing system and its laws start and where another ends, politically. The political borders emerged with the birth of the modern nation-state. While countries have physical borders, the effect of globalization has begun to dissolve borders and they have opened for commerce and cultural, ideological and social exchange (Schmidt-Wetekam 2005, p. 11).

Political borders are sometimes drawn by natural boundaries which can be a geographical landscape such as an ocean, sea, lake, river, mountain, cliff etc. For example, Iguazu Waterfall shapes the political borders of Argentina, Brazil and Paraguay. Also in some cases, borders are defined with physical human-made boundaries such as The Great Wall of China.

2.1.2.4 Permeability of boundaries

In homogeneous spaces, there cannot be a boundary, it's existence is related to its permeability (Geron, 2004, p. 1).

Boundaries can be physically and visually permeable, impermeable or semi-permeable. Permeability is about giving permission to an interaction between inside and outside and it is generally provided with voids. Permeable boundaries which are not created with voids can be two dimensional as a line on the floor. They can be defined with a change in texture, floor, pavement, elevation, color or it can be even drawn with a written sign.

Boundaries can create space by being closed and void-free or they can have voids and they can be open to the surrounding places and be a bridge place. Voids in boundaries, door or windows are thresholds between inside and outside. The voids let living beings, things, light, sound, air inside and organize them (Alkaya, 2015, p.26).

Physical and visual permeability level is provided with size and frequency of voids on the borders or with material. While semi-permeable boundaries let transition or visual permeability at some level, impermeable boundaries don't let any interaction between two parts of a boundary.

The permeability levels of boundaries became an issue when city walls became an inhibitory factor rather than the protector because of the increase of population and other factors that are discussed in chapter 2.2.1. City and Boundaries. The transition on these boundaries and its management has become a new subject and after that, city borders became more permeable.

2.1.3 Functions and Features of Physical Boundaries

In this chapter, the functions and features of boundaries and the reason for their emergence is discussed. As in the previous chapter, it is mentioned, there are visible and invisible boundaries but in this chapter, they are mostly discussed with their spatial effects.

2.1.3.1 Defining, determining and giving an identity

Even if they emerged mostly because of safety needs, boundaries have various different functions and all of them are related to and integrated with each other.

First of all, a boundary defines or determines something, mostly a space or an identity.

Creating a place with boundaries is the first step of architectural activity. A place is defined as a space which is surrounded by boundaries and as the boundaries themselves. It cannot be defined just with space or boundaries (Ataol, 2013, p. xiii-9). Thus, for having a place or a sense of place some kind of boundary is a necessity.

Boundaries also define identity.

Identity can be defined as “all qualifications which are used for defining an existence”. Identity provides differentiation of beings or things from one another and it comes from diversity. If space has or gains identity, it becomes a “place” (Geron, 2004, p. 26).

As it is seen in Figure 2.1, the World “definition” etymologically comes from “boundary” and “end”.

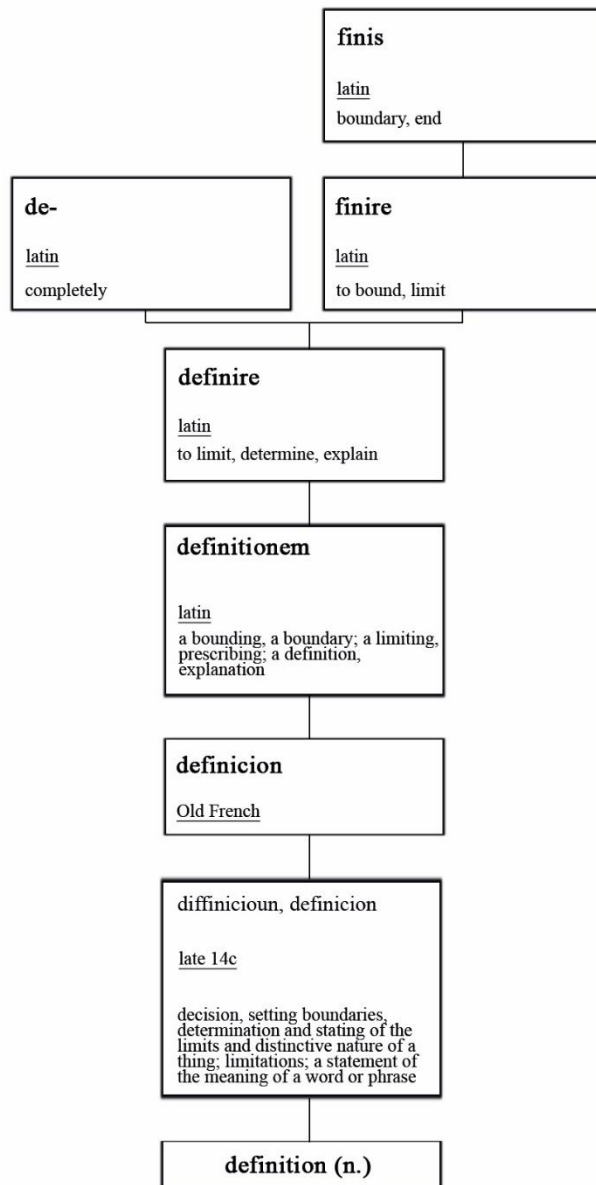


Figure 2.2 Etymology of Definition (“Definition”, n. d.)

2.1.3.2 Privacy

Privacy brings about the notions of being on one’s own and or being close, so the individual cannot be seen and distracted. Privacy provides individuals or groups a relationship with others. It is not just about visual privacy; it covers other senses

like auditory privacy and even privacy in smells. According to Lang (1987), the needed privacy level depends on culture, the person's psychology, individual desires and personality (Mumcu Uçar, 2005, p. 47).

Privacy is related to physio-social territory, domination and customization. These concepts can be claimed to be in a cause and effect relation. Privacy is about the need for security and it is provided with a secure, bounded and defined place. Ünlü (1998) defines privacy as a mechanism that organizes human contact. It is an interpersonal boundary control process. On the other hand, according to Ataol (2013), privacy is a stress situation and reorganization for unwanted interaction, and it allows people to act freely wriggled from his/her social role. Self is closely associated with privacy feeling and self is an essential concern for each people. Geuss (2007) states that the idea of privacy comes from accessing knowledge which is limited, controlled or exclusive. All these are one of the functions and reasons for boundaries because they create an inner and outer one who are deprived and undeprived, a seen and unseen (Ataol, 2013, p. 58-64).

2.1.3.3 Dualism

As the boundaries emerged from the safety need, being inside the boundaries means being safe, so the out or outer is considered dangerous. Boundaries always create an inside and outside as well as an insider and an outsider. Boundaries always comprise contrasts.

Leonarda da Vinci has a mathematical approach to the boundary and he states the boundary belongs to neither inside or outside. It is an independent and unique element. There are various theories about to what a boundary belongs. All of them have different representations of it. Maybe a boundary belongs to both the inside and outside and it is an intersection point but being in the center of inside and

outside makes the boundary something foreign and unfamiliar and it causes uneasiness (Küçükay, 2005, p. 21).

For having a boundary there must be two different phenomena and mostly one of these phenomena is something outer. Boundaries create inside and outside, self and other, object and subject.

2.1.3.4 Psycho-social territory behavior

Psycho-social territory is a signed and customized place and it emphasizes a domination boundary in that place. According to Pastalan (1970), this territory has its own protected environment and the boundaries are defended by its users. Protecting an area helps this place to have an identity. Identity is provided with customization. / Defending a place with psycho-social territory behavior is a prior condition for livability. Because if privacy cannot be provided in a place by customization, psycho-social territory behavior, and domination, it is provided with physical or non-physical separators or boundaries. Territorial behavior includes defense and the defended place. The one who has the right to do it or the one who determines the domination limit customizes the place for giving the message to others. Altman (1975) states that territorial behavior is not only the privacy provider but it also balances social communication and works as a mechanism that organizes boundaries. Psycho-social behavior meets identity need, stimulation need, safety needs and referencing need, and these needs manifest themselves in the place as boundary act. The place which is dominated by the customization and psycho-social behavior is a place with boundaries and it is defended by its owner (Ataol, 2013, p. 64-67). And sometimes customization can be shown as the boundary element itself.

2.1.3.5 Ownership/property

While containing both social conflicts and social order, ownership is an important subject as a boundary builder in a place. Ownership of property can be defined as a relation between the owner and the thing that is owned. According to Grunebaum (1990), ownership entails a bunch of rights as detention, preclusion or ostracism for others, usage, managing, endowment, etc.... (Ataol, 2013, p. 67-68).

Ownership and the rights entailed by this relationship make people protect the owned item and show their rights on them. This is where boundaries emerge as an indicator ownership.

2.1.3.6 Determining hierarchy

The order of the place is in control of hierarchies, and boundaries define social and spatial hierarchies. According to Habraken (1998), in the hierarchy of form, physical pieces, the integration and relations of these physical pieces are controlled. A place is controlled in the domination of hierarchies. According to Bourdieu (1977), a human-made environment includes divisions and different installations of hierarchies and these affect daily life by changing social order without recognition (Mumcu Uçar, 2005, p. 8-9).

2.1.3.7 Dividing

The spaces people cannot perceive with the eyes tend to give the feeling of boundlessness and they remain undefined. That's why, people tend to divide large and spacious areas into small and more perceivable parts to define and understand them better. The notion of division is done with the help of both visible and

invisible boundaries. Today, while countries have boundaries for protection, the subdivisions as states, cities, districts, neighbors, etc. are mostly to perceive and provide order easier.

According to Marcuse (1999) “all boundaries suggest divisions between people and activities in society, between societies or between people and groups” (Mumcu Uçar, 2005, p. 7).

2.1.3.8 Providing order

People need a bounded place for living, expressing himself/herself and meeting his/her needs, and all places have some written or unwritten set of rules or regulations. Utopias are always imagined with boundaries to protect the order (Ataol, 2013, p. 14).

It also shows that boundaries are seen as a protector of not only the place but also the order of the place. The order providing function of the boundaries are among the main reasons why an extensive space is divided with boundaries. Also, another reason for this action is to perceive the places.

While the boundaries can be physical elements that segregate people, keep them into a place and regulate their relationships, they can also be conditions that are determined by rules and laws. These can be walls, places, various symbols, signs and signature systems. They can restrain, support and adjust people's interaction (Mumcu Uçar, 2005, p. 6).

2.1.3.9 Providing connection and interaction

Boundaries contact with space and things in space. They also connect the inner and the outer. They are both connector and divider but the divider role is more dominant because they define inner while alienating the outer (Ataol, 2013, p. 10). If the boundaries are permeable, they allow connection and interaction more.

There are boundaries in places where there is a transition and change. According to Corner (1997), boundaries and contours are highly critical and they create two different sides of the whole. Because of that, boundaries are dynamic intersections that are created with relationships and inverse transformations, more than being a divider. Furthermore, ecologically, a boundary is the most efficient and fertile area because it is the place where the participants and forces meet and interact (Mumcu Uçar, 2005, p. 5-6).

As summarized in this chapter, boundaries have lots of functions and they are all concentric. It is almost impossible to define boundaries without the functions they serve and it is impossible to define boundaries' functions without mentioning another function of it. As a summary of their functions, it can be said that boundaries define, determine, create places, give the feeling of identity, safety, security, privacy, defense, domination and customization, show ownership/property, provide order, hierarchy, divide, provide contrast dualism and at the same time unity, they segregate, connect, become the place of interaction and more...

According to Mumcu Uçar (2004, p. 7), the indispensable and essential boundary idea is everywhere. The cancelation or ignorance of boundaries can make the world a messy, thrilling and an anxious place.

2.2 Social and Spatial Segregation and Boundaries

During the 1890s, the word *segregation* became the preferred term for the practice of coercing different groups of people, to live in separate and unequal urban residential neighborhoods (Nightingale, 2015, p. 1).

Segregation is related to both sociology and geography. White (1983) identifies it sociologically as the end of interaction between groups. Segregation can take place for different reasons, and these can be based on sex, age, income, language, religion, color, some advantages, and some historically transferred factors. According to Bauman (1999), the profound meaning of spatial segregation is a prohibited or suspended communication and maintaining alienation through this. Alienation is the main function of spatial segregation. Spatial segregation is not something new, it can also be seen in the historical process but its effects on society show up and problematize in the modern age. Another dimension of spatial segregation is related to the factors caused by it. Weber (2003), states that groups or interests segregate because of several reasons which as be listed as density, value of the land, rent, accessibility, health, prestige, esthetic concerns (absence of noise, fume, dirt..), different society's choices on specific places, workplace and its quality, income, racial and ethnic characteristics, social status, mores, habits, taste, choice, prejudice and related factors etc. What is more, he also mentions all these factors which are stemmed from inequality (Tümtaş, 2012, p. 54-58).

According to Simmel (1997), human as a connective creature always has to separate and he/she cannot connect without separating. People create meaning by making associations in their environment and while doing this, they make spatial marks and leave traces in the environment (Tonkiss, 2005, Sinirlioğlu, 2015, p. 2).

According to Simmel (1997), a boundary is not a spatial phenomenon that causes social consequences, it is a social phenomenon which shapes itself spatially (Sinirlioğlu, 2015).

2.2.1 City and Boundaries

In this chapter city and its boundaries are examined in historical context. According to Sultansu D'agostino (2018, p. 31), to understand the boundaries' character in today's cities, it is very helpful to have a look at the city's history.

As a boundary, the wall seems as sacred because of the story of Romulus and Remus. There are a few versions of the story, however in this story, Romulus and Remus are twins of the god Mars and Rhea Silvia, and they were thrown into Tiber River to die, but they were found by a she-wolf and nursed until they were found by a shepherd, Faustulus. When they learned who they are, they decided to build a city at the place where the wolf rescued them.

“They, however, could not decide which one of them would be king. To decide, they each took auguries (a traditional Roman divination, consisting of observing bird signs). Romulus went atop the Palatine, Remus the Aventine, and they waited for a sign from the gods. Remus was the first to see a sign, a group of six vultures, but Romulus saw a group of twelve--both were saluted by their respective followers as king. Romulus is then said to have fortified the Palatine with a provisional wall, the original pomerium. Remus, mocking his brothers little wall, jumped over it and was struck dead by Romulus, shouting, "so perish whoever else shall leap over my walls!" Thus, the original pomerium was established the precedent of defending the city was marked with fraternal blood.” (“The Pomerium”, n.d.)

Plutarch states ‘Romulus fitted a brazen ploughshare to the plough, and, yoking together a bull and a cow, drove himself a deep line or furrow round the bounds; while the business of all those that followed after was to see that whatever was thrown up should be turned all inwards towards the city, and not to let any clod lie outside. With this line they

described the wall and called it by a contraction *pomoerium*—that is, *postmurum*, after or besides the wall; and where they designed to make a gate, there they took out the share, carried the plough over, and left a space; for which reason they consider the whole wall as holy, except where the gates are ...’ (Rykwert, 1964, p. 3)

According to Çınar (2013), walls weren’t observed during the first stage of ancient towns, but later walls emerged to protect themselves from invasions. For instance, in the beginning, Athenians built walls just to protect Akropolis and after the Persian invasion, they saw that those walls were deficient and they surrounded all the city with walls (Sultansu D’agostino, 2018, p. 34).

According to Uçar Mumcu (2005), people were also creating boundaries in the first settlement communities in the primitive age. A controlled closure, separation from the outside, defense, social order and protecting the identity has always been a necessity for human existence.

Hedges are other human-made boundaries made up of plants by The Saxons, who organized “strip farming” in which each community of people would have a field that was divided into strips separated by grass verges. People were given a number of strips to farm by the lord of the manner until this system changed in Middle Ages when landlords wanted to put boundaries around their property, so they enclosed their land with walls or hedges. It is believed that the Romans may have first planted hedges in Britain, but most of the few ancient hedges date from Saxon times, making some of them 1000 years old (Hedges, n.d.).

In ancient cities, the walls were used to function as the separators of the city’s dwellers and the ones who were living outside the walls. The wall was for protection and the outsider was enemy. In those times, whenever the city was changed because of wars, disasters or growth, it was built with walls again and again. Not because of the property rights but because of the belief of “people cannot participate in the city’s issues if they don’t have a private place” was the

reason for the respect of private life. The invisible boundaries were protecting the residents from the other residents and the factor that creates these boundaries was the social positions (Ataol, 2013, p. 77-79).

In middle age, the city wall was built more or less similar to the ancient age but the boundaries inside the city wall were not the same. Different social classes were living in different parts inside the walls.

Hibbert (1953) states that the rise of feudal lords and agricultural developments caused production growth which led a group of people became wealthier. The landlords of this feudal structures became wealthier and wealthier and they became the trigger of the trade. However, later the power and wealth shifted to merchants from the feudal lords and they have weakened. Merchants went beyond the local and they started to trade between cities and countries. After that, cities became integrated (Tümtaş, 2012, p. 32).

Marcuse (1999) states that the reason for the demolition of walls was the middle/bourgeois class's financial growth and it was also about the industrial revolution. Powerful guns and weapons had weakened the strength of walls and after that liberal democracy arose and capitalism gained power. Technological and socio-economic changes made the city walls useless (Mumcu Uçar, 2004, p. 18).

Braudel (2004) states that almost every city had walls between the 15th and 18th centuries. Therefore, people were caged in a segregated and compeller geometry and they were segregated from the lands next to them. The reason for this segregation was mainly safety and the wall was an economic and social division line. During the expansion of cities, the outer districts were added to the center of them and the activities which are more uncit-y-like were pushed off. Mainly western but most of the world cities had outer neighborhoods which were regarded as low, and going there meant going down (Tümtaş, 2012, p. 33-35).

In the modern age, in addition to trade capitalism, industrial capitalism increased social inequality and deepened the already sharpened social class distinction and spatial segregation. After industrialism, cities started to expand both geographically and demographically, especially in Europe. According to Mumford (2007) urbanization increased in direct proportion to industrialization. In the 19th century, spatial segregation in the city became based on social classes because of the inequality and dependency caused by capitalism (Tümtaş, 2012, p. 36-40).

The history of modern cities began with the French Revolution in 1789 and the industrial revolution which began with the first steam machine in the 18th century because they both caused a spatial revolution. French Revolution brought kingdoms, feudal structure and the domination of aristocracy to an end, and as a consequence the integrated and singular power is broken into pieces. Also, with the industrial revolution, the places in the cities started to separate for industrial areas, residential or school areas. While immigration increased the population, more industrial and residential areas are needed for immigrants. All these shaped the unplanned and chaotic city life. The enlightenment ideals advocated freedom in every walks of life and this unlimited freedom disrupted urban integrity. Before the modern age, people tend to see themselves a part of the order and they were not feeling free because of the hierarchic order, limitations and social role. In the modern age, these factors and ethics power has been weakened and this revealed the individual defense need. According to Simmel (2011), modern people need a bounded inner shelter for environmental stimulations for preparing himself/herself all these sensory bombardments. In this chaotic structure, he/she answers the changes with indifference. Thus, this caused him to create a distance between himself/herself with his/her social and physical environment. Otherwise, he/she tries to defend himself/herself by trivializing the objective world and the other people. All these show up as physical boundaries. These boundaries represent the individual's autonomy and defend of his/her individualism. While the city expands

and its boundaries become uncertain, the boundaries inside visibly enlarge (Ataol, 2013, p. 81-84).

In the globalization age, the growth in work areas created new city centers and expanded the city. Bauman (1999) states that spatial and social segregation is an integral part of globalization. People, money and goods rapidly flow and trade and economic processes became international due to technological improvements. The service sector has evolved, the need for a qualified workforce has arisen and unemployment occurred. Also, all these caused socio-economic segregation and social polarization in all levels of society. Social inequality and division allow some part of society for integration and urges some of it to exclusion. These divisions also reflect spatial patterns (Tümtaş, 2012, p. 45-49).

According to Ataol (2013), the uncertainty of social life, city's chaotic structure and a lack of a center control point of the city caused need more control and they create more strict boundaries, in a global city, economic power and status are important factors for people. In this era, globalization caused more monotype places and people feel the need to customize it. According to Bauman (2010), the city provides new spatial offers and boundaries for this need and allows people to reflect their cultural and individual features to the place (Ataol, 2013, p. 85-87).

Weiskopf (2002) states that boundaries are one of the main reasons for people's uneasiness in the city. Before the modern age, walls were used to create a sense of safety and when the boundaries increased and moved inside the city with modern dynamics, the inside and outside distinction disappeared, and this caused the fear. McClung (1983) states that the primitive fear of outside can even be seen in middle age pictures and most of the heaven depictions are drawn with an enclosing wall (Küçükay, 2005, p. 22).

2.2.3 Fear of City

Another point of view for segregation and the rise of boundaries is related to the collapse of public space.

The known first open space but physically undefined meeting point is Greek acropolis. Later in it became agora which is horseshoe-shaped and enclosed site with public buildings and a place for public functions. The commonplace for Roman cities is a forum that is placed in the junction point of the irregular street network. The walled cities in middle age have squares which develop next to religious buildings and in these squares, some religious or nonreligious ceremonies, public punishments, and bazaars for commercial purposes have been held. It is important to note that people from every social class were using the same square. In the 19th century, with the industrial revolution, public places were transformed into lost public spaces that cannot meet people's requirements (Geron, 2004, p. 30-31).

According to Dedeoğlu (2008), the immigration to the city caused by capitalism, consumer culture, transportation developments and communication technologies increased the danger, fear of metropole's obscurity and lead people who need safety to detach from the city and move aside to their inner places after the 19th century. Because of spatial segregation, people used different parts of the city and they don't have a common public space to meet with other communities and this causes more differences between the communities and strengthens the segregating power of the boundaries. In this situation, people cannot share their differences, they just interact with similar ones and the downfall of public spaces has become inevitable. Public spaces are the places where individuals meet with "the other". Metropolitan city, perceives the other as a danger. The segregated communities create places where the other cannot be involved and eventually open public spaces which are claimed to be open to everyone to share gradually decays and disappears.

With the development in transportation systems, high-income groups moved into gated communities where they don't meet with the other and have all the opportunities that the city offers for "life quality" in a segregated area allocated only for them or the ones they choose to be around. These places are a simulation of public places (Dedeoğlu, 2008, p. vi-21).

According to Marcuse (1997), the elements which act like boundaries such as walls, fences, signs trigger the social uneasiness like division, inequality, fear, alienation between two parts of a boundary (Dedeoğlu, 2008, p. 25).

To sum up, after the industrial revolution and later with globalization, cities get crowded this caused both the collapse of public places and more social and spatial segregation. They are triggered and affected by each other. When people do not have a public space to interact with the "other" they tend to segregate more and it also causes not to have common public spaces with all city residents.

2.2.4 Gated Communities

When speaking about social and spatial segregation, it is essential to mention gated communities that arose in the 20th century as they still stand as the most eye-catching examples of segregation.

According to Blaky and Snyder (1997), a gated community is a residential area which is strictly controlled during entry and exit; all facilities and services in it are only available for its residents and all the area is protected with securities and it is segregated from outside with walls or fences. Streets, parks, sidewalks, gardens and every place supposed to be public is controlled in gated communities. According to Harvey (2000), the first examples of gated communities were satellite towns but today they are lapsing in the city centers. While they are getting closer to the city

center, it had an inverse effect and it made gated communities further than city and people. These areas with high walls increased and reflected social inequality and uneasiness. These independent areas can be physically close and they can be next to the city center but corporately, they are disconnected (Küçükay, 2005, p. 61).

According to Sinirlioğlu (2015), the new physical boundary phenomenon that has arisen with gated communities is facilitated by segregating different socio-economic, socio-cultural, politic and psychologic approaches and it can be their consequence. According to her research, boundaries destroy the relationships that created by itself, like transition, gathering, inside and outside relationships, and spatial identity; also these boundaries decay the urban fabric and create a separation point instead of a connection line. These boundaries are drawn by one side by alienating the other part and determine adverse effects on both sides of it and the whole city (Sinirlioğlu, 2015, p. 4).

In this second chapter, the meaning of boundaries, their emergence reasons, types, functions, and features are defined, and their relation to social and spatial segregation is examined by looking more in-depth to the city's history about boundaries and boundaries status in today's cities. The next chapter defines boundaries and urban design by starting with defining public and private spaces and examining the urban design objectives and their relation to boundaries, giving examples of urban design review guidelines from abroad, which have regulations about residential site boundaries detailly and finally examining residential site's boundaries, their functions, features, and types.

CHAPTER 3

BOUNDARIES AND URBAN DESIGN

Urban design is the process of giving form, shape, and character to groups of buildings, to whole neighborhoods, and it is concerned with the arrangement, appearance, and function of suburbs, towns, and cities. It involves many different disciplines including city and region planning, architecture, landscape architecture, engineering, economics, law, finance and more.

Urban design operates in many scales from the macro scale of urban structure to the micro-scale of street furniture and lighting. The elements of urban design are buildings, public space, streets, transport, and landscape (Urban Design, n.d.).

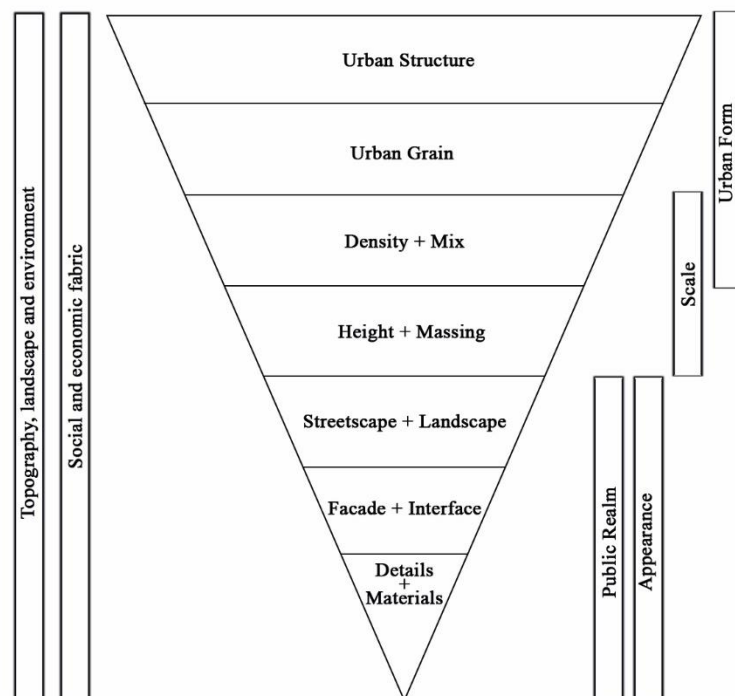


Figure 3.1 Urban Design (Urban design, n.d.)

Figure 3.1 shows elements of urban form from macro to micro. Residential garden borders are on the micro-scale of urban form; on the other hand, they affect the whole urban structure.

Boundaries in urban areas which have the function of connecting and separating different physical, social, economic, politic and cultural factors are multi-layered and complicated systems that create a spatial organization of urban fabric. Today, with increasing population and urbanization, boundaries that create spatial fabric in cities, constantly change its form and meaning (Sinirlioğlu, 2015).

3.1 Public and Private Spaces

According to Madanipour (2003, p. 6), the division of urban space into the public and private is a physical manifestation of the relationship between public and private spheres in society and it turns out that they are related to reflection of the deeper level relationship between the individual and society, between self and other. Hall (1966) classifies interpersonal relationships, and following that the spaces among individuals, into four categories: intimate, personal, social, and public and he identifies two types of personal spaces; the first is close phase and it is between 45 to 75 cm and the second is far phase and it comprises 75 to 120 cm the distances change depending on different cultures. Madanipour states that when a home is the living place of a single person, boundaries of personal space may be extended for the space of the home and personal space of the body become one and the same. When invisible and portable personal space is extended and institutionalized, it takes the legal form of property or the intimate form of home. It is the fixed forms of private sphere and territory.

“[The private sphere]...is a part of life that is under the control of the individual in a personal capacity, outside public observation and knowledge

and outside official or state control. It is a part of space belongs to, or controlled 'by, an individual, for that individual's exclusive use, keeping the public out." (Madanipour, 2003, 35)

He mentions that public and private spheres in the city entirely depend on the boundaries that separate them and these boundaries face two directions; on the one hand it keeps the disruptive material out of the public arena and, on the other hand, it protects private life from the public gaze. By defining space and enclosing it with boundaries, the social relations take a spatial form and from this perspective, Madanipour (2003) defines city building as a boundary-setting exercise. He states that when a boundary is more ambiguous and articulate, the place is more civilized, and when two realms are separated with rigid walls, the line of interaction becomes arid and communication limited so that the social life is poorer (Madanipour, 2003, p. 23-66).

According to Moughtin (2003, p. 2), the public realm consists of streets, boulevards, squares and public parks together with the building façades that define them.

Today, in most places, it is difficult to see a building's façade since garden borders block them. So, the definition can be modified with the border's façades. Borders are designed and constructed in the boundary of the private realm but people who use the public realm are affected by them.

3.2 Urban Design Objectives and Boundaries

Analyzing boundaries in the urban design objectives helps to understand their effect on the city better. The objectives of urban design are legibility, character,

diversity, continuity and enclosure, ease of movement, adaptability, and quality public realm (“Illustrated Urban Design Principles”, 2010).

3.2.1 Legibility and boundaries

By urban legibility, Lynch (1960, p. 2) means “the ease with which its parts can be recognized and can be organized into coherent pattern..... A legible city would be one whose districts or landmarks or pathways are easily identifiable and are easily grouped into an over-all pattern.” According to Lynch, the physical forms in the city can be classified into 5 elements which are paths, edges, districts, nodes, and landmarks.

Boundaries or borders can be classified as edges in this classification. Lynch defined edges as linear elements not used or considered as paths by the observer. Edges can be boundaries between two kinds of areas and linear breaks in any type of continuity. Edges may also have directional qualities as paths. Shores, railroad cuts, edges of developments, walls can be edges. Edges are not coordinate axes but lateral references. Edges are not dominant as paths. They can be considered as organizing features, particularly in the role of holding together generalized areas and as in the outline of a city by water or wall (Lynch, 1960, p. 46-66).

Also, legible residential borders can ease to understand and navigate the place and create a better urban environment.

3.2.2 Character and boundaries

A city or neighborhood must have a recognizable image for its residents or visitors (“Illustrated Urban Design Principles”, 2010). The appearance of the built

environment defines an area's identity and character and it creates a sense of place (Khan, 2018, p. 79).

Any urban element such as historic buildings, street art or public spaces, etc. can help an area gain a character, and it is also possible for a boundary element. Natural boundaries as a river or cliff can make a place recognizable and also a manmade border can make a similar effect. Berlin wall which was used after WWII in Berlin to segregate the city is an example of that. An extraordinary or ordinary but continuous residential area border or fence can also give a character to an area.

3.2.3 Diversity and boundaries

According to Illustrated Urban Design Principles (2010, p.5), a successful neighborhood within a city provides for diversity and choice through a mix of compatible housing and building types and land uses. As cities are dense and complex areas, they must provide diversity and choices in various contexts. According to Khan (2018, p.87) a place with diversity promotes varieties and choices through a mix of compatible developments and uses that work together and according to Bell (1993, p. 99) diversity is concerned with the variety and differences in a design or landscape. There is a basic fundamental need for visual diversity in order to provide stimulus and enrichment to the quality of life in a place.

Different residential boundaries can provide diversity sometimes in every a few meters with their high, material and other features. While providing this diversity it is important to follow basic design rules to create a unity.

3.2.4 Continuity and enclosure and boundaries

According to Abbasiabagh et al. (2013, p.2) studying how to achieve continuity in the urban form and fill gaps in urban streets should be part of design guidelines for creating consistent urban spaces. According to Bell (1993, p. 124), the presence of continuity of patterns in the landscape helps to control scale and to absorb small changes within a more dominant whole. Repetition of a particular shape at a range of sizes and scales represents an aspect of continuity which can be seen at a range of observer positions. Continuity allows change to occur without creating chaos.

A continuously built form street frontage is needed throughout an area to allow users to easily understand where they are (“Illustrated Urban Design Principles”, 2010, p. 5). Continuity can also show itself by repetitions in the height, material and other features or residential borders. While designing these borders, it is important not to disrupt the continuity of other elements such as street network.

Bell (1993, p. 116-118) states that when elements enclose space, both elements and space appear as complete forms and completely enclosed spaces become inward-looking while partially enclosed spaces allow space to flow in and out. The degree of enclosure that perceives depends on whether the enclosing element is above or below head height.

High residential site borders create enclosed spaces inside the site, and if a street is adjacent to a few high bordered residential sites, the street is also perceived as enclosed. Enclosure level is not only about the height of the borders, and it can be decreased with visually or physically permeable borders and materials. Therefore, enclosure level affects also continuity.

According to Khan (2018, p. 80), space is an area where public and private spaces are distinguished to promote continuity of street frontages and the enclosure of

space by development which clearly defines private and public areas. He states that the street forms are the interface between the public and private realm.

3.2.5 Ease of movement and boundaries

Ease of movement is creating a place that is easy to get to and move through. To promote accessibility and permeability by making places that connect with each other and places that are easy to move through, it is necessary putting people before traffic and integrating uses and transport (Khan, 2018, p. 83).

According to Illustrated Urban Design Principles (2010), a compact urban form, a legible urban structure (i.e. grid network of streets), short blocks, pedestrian priority and a built form that is transit and pedestrian-oriented ensures an area which provides the users with maximum convenience for movement.

When a residential site is fully enclosed, like gated communities, it prohibits the ease of movement both for its residents and for others. These borders don't let outsiders pass through and don't let its residents reach outside easily. Most of the impermeable or semi-permeable bordered residential sites extend the routes for pedestrians and vehicles. This winding causes time and cost waste.

It is important to create a network of interconnections for pedestrians that offers many options to access any location such as streets, mid-island crossings, paths, mobile parks, and tracks. This network must guide people to shops and services and it must give the feeling that walking is a better option than a car ("Kentsel Mekân Standartlarının Geliştirilmesi", 2017, p. 97).

3.2.6 Adaptability and boundaries

An adaptable place is a flexible one that can change easily while the city is constantly changing socially, technologically and economically (“Illustrated Urban Design Principles”, 2010, p. 5).

In Turkey, landscape design and implementation of residential areas are applied after the architectural construction and mostly because of the low budget, landscape cost is kept at minimum. Borders are a part of landscape design. Thus, they are also in the last part of the design and application process. For being able to pay the cost, in the beginning, the borders are generally designed for meeting the minimum requirements, especially in high rise apartment residential areas. If there occurs a need for changing, renewing and restoring the borders, they are rebuilt later (Figure 3.2). Generally, residential garden borders are not physically integrated with any structure and it is not very difficult to rebuild them when compared to other elements of design. Thus, in Turkey, mostly, the borders are not designed adaptable, but they adapt to changes that they need in time.



Figure 3.2 Borders of An-90 Residential Site in time

3.2.7 Quality public realm and boundaries

The aim is creating high-quality public spaces that are attractive, safe, comfortable, well maintained, welcoming and accessible to everyone (Khan, 2018, p. 81). Urban green spaces have many positive effects on quality of public realm with their environmental and public health.

According to Rakhshandehro et al. (2017, p. 12-13), green open spaces have environmental benefits such as helping nature conservation, protecting habitats and preserving biodiversity, having a cooling effect and reducing air temperature and urban heat islands (Arabi et al., 2015), contributing air pollution removal and carbon sequestration (Konijnendijk et al., 2013; Setälä et al., 2013), reducing noise (Watts et al., 2013; Veisten et al., 2012) and creating buffers for sight and air pollution (Yang et al., 2011; Veisten et al., 2012), cleaning harmful contaminants.

According to Rakhshandehroo et al. (2015, p. 61), the social benefits of open green spaces are providing space for socializing, political discourse and cultural expression (Li, 2014), encouraging people to spend more time outdoors, meet and interact. Also they create area for passive and active recreational activities, increase knowledge and awareness of environmental issues (Olsson, 2012), reduce the fear of crime (Taylor et al., 2002), have positive impact on public mental well-being, (Van Dillen et al., 2012), psychological well-being (Abkar et al., 2010; Stodolska et al., 2011), enhanced concentration capacity (Tsunetsugu et al., 2013), decreased Attention Disorder Hyperactivity Disorder (ADHD) indications (Kaplan and Kaplan, 1989; Taylor and Kuo, 2009), post-disaster recovery (Rung et al., 2011; Okvat and Zautra, 2014) and self-reported general health, feelings of pleasure, enjoyment, relaxation, comfort and calmness (Stigsdotter et al., 2010; Schipperijn et al., 2010) and also tranquility (Watts et al., 2013; Rakhshandehroo et al., 2015, p. 61-65).

Green open spaces in urban areas can integrate with green infrastructure and offer recreational and aesthetic amenities while also containing spaces that mitigate stormwater or improve air quality. Green open spaces improve general mood and attitude, help reduce stress, create better mental health and functioning, improve mindfulness and creativity, build social capital (Wolf, 2017).

According to Woolley (2003), active recreation involves facilities such as sports or other games and passive recreation includes activities such as observing children or others or wildlife, taking in the view, reading, relaxing or interacting with acquaintances (Rakhshandehroo et al. 2015, p. 63).

Not only the active use of these green open spaces but also passively engaging them has positive effects on human psychology. According to Shahri (n.d., p. 4), studies suggest that views of natural spaces from home, or workplaces can have a restorative effect.

Today, the amount of green areas decreased in most urban areas, so people cannot reach green open spaces actively, but at least having the opportunity to see such green areas can improve mental health. When the residential gardens are too high or visually impermeable, people do not have the opportunity to experience the open green areas of private residential areas. The same thing is valid for the people who live in the houses when the borders are too high and visually impermeable, they don't have the opportunity to see the green open spaces outside of their residential site.

By being between the public and private spheres, residential borders have a great impact for urban areas and public space quality. Their regulations are discussed in different headings.

The new Urbanism decisions which could be related to residential garden borders are;

- “19. A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.
- 20. Individual architectural projects should be seamlessly linked to their surroundings. This issue transcends style.
- 21. The revitalization of urban places depends on safety and security. The design of streets and buildings should reinforce safe environments, but not at the expense of accessibility and openness.
- 23. Streets and squares should be safe, comfortable, and interesting to the pedestrian. Properly configured, they encourage walking and enable neighbors to know each other and protect their communities.
- 24. Architecture and landscape design should grow from the local climate, topography, history, and building practice.
- 25. Civic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy. They deserve distinctive form because their role is different from that of other buildings and places that constitute the fabric of the city (“The Charter of the New Urbanism”, 2000) “

Moreover, the Congress for the New Urbanism (2000) defines a safe place, which is related to residential borders, with some factors which are;

Having people around: A person in a public space must feel the others and buildings surround the place.

Friendship: The scale and size of a place must encourage people for comfortable interaction.

Human protection: The mechanical tools such as cameras and gates must be invisible and police presence must be provided.

Visibility, light, and openness: Open views and being seen by other people and seeing them, provides natural audit.

Order: Coherent landscape, street frontages, and signs are an indicator of a safe and well-managed place.

Connections: Perceivable places as a part of the connective street and public places network make the place safe and they are important for giving the feeling of easy access.

Legibility: Reading every place as a connective part of the rest of the city, prohibits lostness feeling and ensures the feeling that people control the relationship of themselves with the city and the other people (Kentsel Mekân Standartlarının Geliştirilmesi, 2017, p. 95-96).

3.3 Urban Design Review Guidelines and Boundaries

States, cities, municipalities, neighborhoods, or residential sites may have some regulations about residential borders for providing better urban spaces. These regulations are given in urban design review guidelines of urban units and provide legibility, unity, character, continuity, enclosure, ease of movement, adaptability in urban areas, and increase the quality of public space. Residential site borders must be studied multiscalar as they have effects both on street level and higher scales. Some examples of residential site border's urban design guidelines for different areas are listed below which are City of Roslyn (Seattle, Washington, USA) (Figure 3.3), Highgrove Residential Development (City of Casey, Australia) (Figure 3.4, 3.5), City Of Sumter (South Carolina, USA) (Figure 3.6), City of Spring Hill (Tennessee, USA) (Figure 3.7), Oakland (California, USA) (Figure 3.8, 3.9).

H. Fences and Hedges.

Fences and hedges are subject to the following standards in all zones:

1. Fence Height Restrictions.

- a. Residential zones: front yard – four feet or less.
- b. Residential zones: side and rear yard – six feet or less.
- c. Commercial overlay zone: front yard – four feet or less.
- d. Commercial overlay zone: side and rear yard – six feet or less.
- e. Commercial and light industrial zones: all sides eight feet or less.
- f. Corner lots in residential and commercial overlay zones: rear yard – six feet or less.
- g. Corner lots in residential and commercial overlay zones: front yard – four feet or less.
- h. Corner lots in residential and commercial overlay zones: side yards – four feet or less on the side facing the city right-of-way, and six feet or less on the side facing another lot.

2. Hedge Height Restrictions.

- a. Residential zones: front yard – four feet or less.
- b. Commercial overlay zone: front yard – four feet or less.
- c. Corner lots in residential and commercial overlay zones: front yard – four feet or less.
- d. Corner lots in residential and commercial overlay zones: side yards – four feet or less along the right-of-way.

3. Fences and hedges on corner lots shall not block intersection sight lines for traffic and pedestrians as determined by the city.

4. Fence styles shall be in harmony with the general historic character of the city of Roslyn as depicted in the standards and guidelines. Picket, solid wood, board on board, wood and wire, post and rail, and wrought iron fencing are the recommended styles.

- a. Wood-framed fences with wire grid or mesh are acceptable. Chain link fences are prohibited.
- b. The posts of a wood fence may be metal if the design matches existing historic fences in Roslyn and the framing is made of heavy rounded pipe at least two inches in diameter.
- c. Decorative metal gates are allowed. [Ord. 1168 § 1 (Exh. A), 2019.]

Figure 3.3 Roslyn Municipal Codes | Fences (City of Roslyn, Washington) (2019)

6.0 Fencing

6.1 GENERAL

Boundary fencing must be fully constructed prior occupancy.

No front fences will be permitted.

Side and rear boundary fences shall:

- Not exceed 1.95m in height
- Be constructed from capped timber palings with exposed timber posts (75mm X 125mm).
- Finish a minimum of 1m behind each side of the front façade (not including the entry feature/porch),
- Side boundary fencing along the secondary street frontage of a corner lot must finish at least 3m behind the front façade and behind the corner treatment, whichever is greater.

Fencing must return from the side boundary at 90 degrees to abut the dwelling. Return fences must be constructed to match the boundary fencing or from timber slats and must be setback to allow access to meter boxes.

The owner is solely responsible for the maintenance and/or replacement of fencing between a lot and any adjoining screening reserve or recreation reserve. If a lot already has a fence or wall erected by the Developer to enhance the domain, the owner must not remove nor damage or disfigure it and must maintain it in good condition. Any alteration of part of the wall or fence shall not be made without the Developer's written permission.

6.2 FENCING TEMPLATE

The location and design of all fences is to be included on your plans and submitted to DRC for approval along with the signed fencing template (section 10.0)

The corner and standard lot fencing plan can be adopted by the owner by signing and attaching the fencing diagrams with the submission to the DRC.

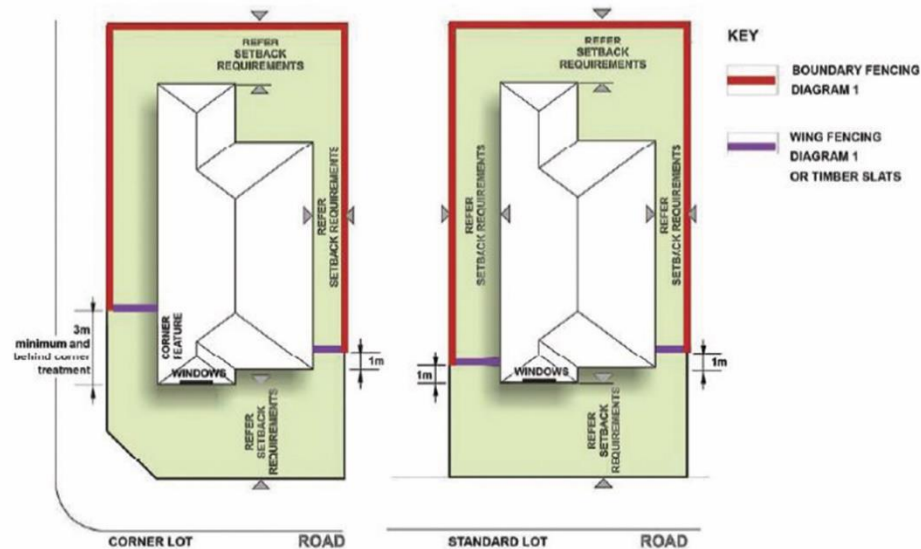
This will be endorsement that the fencing will be carried out as per Highgrove fencing requirements.

Note: Some allotments may not be considered as 'corner' or 'standard' allotments as shown on the fencing template diagram, due to their layout or shape. For allotments such as these, the location of fencing must be specifically approved by the DRC.

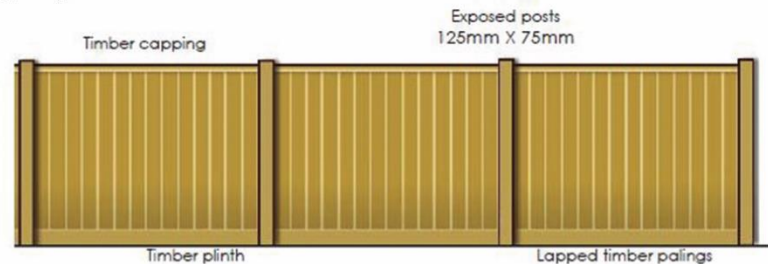
Figure 3.4 Highgrove Residential Development Design Guidelines, Clyde North, City of Casey, Australia ("Highgrove Design Guidelines", n.d., p. 17)

10.0 Fencing Template

Fencing Template: Fencing locations for standard and corner lots



Fencing Diagram: Side and rear fence construction details



I/we, being the property owners of lot _____, hereby confirm that I/we will construct all fencing in accordance with the Highgrove Design Guidelines, including the fence height, location, style and materials.

Name:

Signed:

Date:

Figure 3.5 Highgrove Residential Development Design Guidelines, Clyde North, City of Casey, Australia (“Highgrove Design Guidelines”, n.d., p. 20)

5.2 FENCES AND WALLS

Fences and walls delineate property boundaries, as well as distinguish private from public outdoor space. In Hampton Park, front yards are traditionally open to the street, with a fence enclosing the backyard for privacy. Low retaining walls exist where the front yard is above the grade of the sidewalk. These walls provide a clear termination of the yard, help to prevent erosion, and add decorative features to the front of the house. Retaining walls can be of stone or brick construction, or rock faced hollow core concrete blocks.

A. PRESERVE AND MAINTAIN HISTORIC FENCES AND RETAINING WALLS.

B. CHOOSE NEW FENCING THAT ENHANCES THE ARCHITECTURE OF THE BUILDING.

- > Select a fence design that relates to the style and character of the building.
- > Use traditional materials to build new fences or use appropriate contemporary materials with a traditional appearance.
- > Limit front yard fencing to open designs, such as painted wood picket or simple wrought iron fencing that will not obscure views of the building from the street.
- > In downtown commercial locations, use simple, low metal fencing in an open design that will not obscure views of the building from the street.
- > Avoid incompatible fencing—such as wood plank, split rail, vinyl, solid brick, or chain link fences along prominent, visible property lines. Wood plank fences and solid wall brick fences may be added on the side property lines of corner lots adjacent to the street.
- > Do not use split rail fences in the historic districts.
- > Use ivy, vines, or other plant materials to cover or screen chain link fences.
- > Do not exceed fence heights of 4 feet on the front property line and 6 feet on side and rear yards.

C. BUILD NEW RETAINING WALLS WHERE NECESSARY.

- > Use stone or brick for new retaining walls. Brick can be reinforced, fully bonded or masonry veneer over reinforced concrete block.
- > Do not use poured concrete, exposed concrete block, wood timbers, or crossties for new retaining walls.

Figure 3.6 Design Review Guidelines City Of Sumter, South Carolina, USA | Fences and Walls (“Design Review Guidelines”, 2017, p. 72)

(2) Fencing: Fencing is the preferred screening method in the City of Spring Hill for multifamily developments that adjoin a conflicting land use or a residential development proposing double frontage lots. All required fencing, which is used to screen or create privacy in the City of Spring Hill, shall adhere to the following requirements:

- a. The preferred fencing type is brick/masonry or stone. Fencing constructed of treated wood or ornamental metal may be approved by the Design Review Commission and reviewed on a case-by-case basis. The use of untreated wood, plain concrete block, chain link, wire, metal mesh, or corrugated metal panels shall not be used as fencing or screening.
- b. The fencing shall provide an opaque view of the screened area.
- c. Fences shall be set back from the street right-of-way to allow a clear area for utilities and landscaping. Landscaping shall not conflict with any utility easements.
- d. Where approved, wood fences shall have brick or stone columns located a maximum of seventy-five (75') feet on center, and the wooden fencing shall be constructed with a wood cap.
- e. Fences shall not create a stockade appearance. This can be accomplished by staggering fencing materials between columns to add depth to the screening. Fences over one hundred (100') feet long on double frontage lots facing streets shall have no more than fifty (50') percent of their length in a straight line and shall provide a setback of five feet or more from the fence line.
- f. Fencing shall be designed to facilitate maintenance and shall not modify natural drainage so as to endanger adjacent property.
- g. The maximum height of the fence may not exceed a height of eight (8') feet.
- h. The use of berms with appropriate dense screen planting along the top of the berm is encouraged.
- i. Fencing shall lie within defined common open space areas or easements owned and/or maintained by established property owner associations.

Figure 3.7 Spring Hill Design Review Guidelines | Fencing (“City of Spring Hill”, 2013, p. 25-26)

Criterion 11: Street Fronting Fences and Freestanding Walls

(a) Street fronting fences and freestanding walls shall not be overly dominant within the streetscape and shall relate well to buildings, landscaping and other streetscape design features.

(b) Fences and freestanding walls within front yards and the front portions of Street side yards on corner lots shall complement the architectural style of the adjacent residence.

"Front portions of Street side yards" refers to the portions of street side yards adjacent to the main residence and does not refer to portions at the rear of the main residence. See Criterion 10 (Landscaping) for general provisions concerning fences and walls, including retaining walls.

INTRODUCTION;

The Oakland Planning Code's standards for Street fronting fences and freestanding walls are found in Section 17.108.140 and are summarized as follows:

Height Limits for Street fronting fences and freestanding walls:

1. Front yards and front portions of Street side yards: 42" by right and six feet with a Conditional Use Permit.

One entry gateway, trellis or other entry structure is allowed by right in front yards if the structure's height or width does not exceed ten feet.

2. Rear yards on double frontage lots and rear portions of Street side yards: Six feet.

Restricted Materials:

1. Chain link fences higher than 42" are not allowed in front yards and front portions of Street side yards.

2. Barbed wire and razor wire are not allowed.

3. Plain concrete block is not allowed unless capped and finished with stucco or other material approved by the Director of City Planning.

Note: Criterion 11 and the Guidelines listed below apply only to Street fronting fences/walls that: (a) are taller than 42" and require a Conditional Use Permit; or (b) are part of a landscape plan requiring City approval.

GUIDELINES;

11.1 A front or Street side yard fence/wall should not call attention to itself, but instead focus and direct attention to the residence. Avoid fences/walls in the front or Street side yard that are overly dominant features with the streetscape.

11.2 Use front and Street side yard fence/wall designs that complement and are consistent with the architecture of the building. For example, wood fences are usually inconsistent with Mediterranean architecture, but low solid stucco walls or iron picket fences often work well.

11.3 Avoid solid wood fences in front and the front portion of Street side yards. Portions of fences/walls that are in these yards and taller than 42" should be at least 70% transparent, and the fence/wall as a whole should be at least 60% transparent.

11.4 Maintain a regular rhythm in the fence/wall design. Except for Gates and other special situations, the length of fence sections between posts should be as equal as possible. Posts should usually all be the same height, except when the overall fence height changes.

Figure 3.8 Oakland Design Review Manual For One or Two Unit Residences
("City of Oakland", 2015, p. 11-1/2/3/4)

11.5 Design fence/wall entries to give visual prominence to the residence and direct attention to the building entry.

11.6 Set front or Street side yard fences/walls out of the public right of way and at least 18" back from the edge of the sidewalk. Landscape the unpaved strip between the fence/wall and sidewalk. (Note: Fences/walls that are not set back at least to the lot line are within the public right-of-way and require an encroachment permit. On most streets, the sidewalk does not extend all the way to the lot line, resulting in a strip of unpaved right-of-way often over three feet wide that looks like it is part of the private property.)

11.7 Whenever possible, maintain the same alignment as other Street- fronting fences/walls along the block face. (Note: If all fences/walls were installed along the property line, they would automatically be aligned. However, since many Street- fronting fences/walls are constructed within the public right-of-way, often illegally, maintaining such alignment will not always be possible.)

11.8 Maintain the basic geometric characteristics of any other Street fronting fences within the block face, such as overall height (except for existing fences over the Planning Code's 42" height limit and where the new fence will be within the height limit), height of top rails and general rhythm of openings.

11.9 Use dark colors for metal fences.

11.10 Street-fronting chain link fences should either have a dark vinyl covering (available colors are usually dark green or black) or be painted a dark color. They should also be accompanied by climbing vines or other vegetation that will mask their visibility.

11.11 For Street fronting fences/walls taller than 42", the required vegetation along the Street side base should have an ultimate height of at least one-third of the fence/wall height to reduce the structure's visibility.

11.12 For wood or metal picket front and Street side yard fences, consider a solid base up to about one foot high. This gives a solid architectural quality to the fence and helps relate it better to surrounding buildings.

*Guideline is supported by images of fences/walls.

Figure 3.9 Oakland Design Review Manual For One or Two Unit Residences (2015 p. 11-1/2/3/4)

In Turkey , according to Development of Spatial Urban Standards (2017, p. 225), the cooperate study of Turkish Republic Ministry of Environment and Urban and Mimar Sinan Fine Arts University, the local regulation for garden walls in architectural standards for urban areas is “garden walls that have facades to the street must be built according to standards and in harmony with the main building’s front façade”. The principles for creating building façades can also be used for creating border elements as they affect street character at eye level. These regulations can guide the requirements and designs of residential borders.

In the next chapter, residential areas and their gardens, relationship, functions of garden borders and 3 parameters for researching the effect of residential garden borders on urban areas are reviewed.

3.4 Boundaries of Residential Sites

In this chapter, the house, its environment, and the relationship between the boundary with what is around, functions and types of house garden borders and 3 parameters for understanding borders in urban context are reviewed.

As it is mentioned in the previous chapters, shelters with boundaries firstly emerged because of safety from weather conditions, wild animals and other threats.

The house, as a basic need, cannot be imagined without its surroundings. Rapoport (1977) stated that a house is located in a physical, psychological and socio-cultural environment. A house cannot be regarded as isolated from its surroundings, in contrast, a residential settlement system is formed with surrounding individuals, neighbors and facilities. According to Lawrence (1987), a house’s environment is a fundamental living space that meets the residents’ needs, provides satisfaction and promotes individual’s and society’s public health (Kumbasar, 2013, p. 4) .

Yeşil and Yılmaz (2005) stated that the house can be defined as a place that has special meanings for its users and it is the place where private life proceeds. A house and its surroundings which open it up to the outer world and take part as a bridge are closely related (Bilir, 2019, p. 11-12).

A house's physical environment starts with the house's outer walls and it covers all the places and facilities which are within the walking distance. In the house's physical environment, the house garden is the closest place to the house. Not all the houses may have a garden; however, all of them have a physical environment, and mostly this close environment is a softscape or hardscape or softscape/hardscape dominated garden. In some cases, the garden is built indoors and it becomes a courtyard. If the garden is the house owner's property, the place is called the house garden. While the houses are evolving from the caves and tents to high-rise residences, the house's environment also changes and evolves in time. The house and its environment have always completed and affected each other and they evolved together (Bilir, 2019 p. 11-12).

The idea of garden is related to the magnificent "garden of heaven" myth. In all religions and doctrines, heaven is a symbol of happiness and abundance, also one of its most important features is that it has a boundary that separates it from outside and outsider. In old Persian language, the word "pairi-dae-za" comes from the word "pardisu" in Babylon language and "pardes" in Hebrew which both mean surrounded with wall or fence. And also the word is associated with the word "paradise". Heaven's feature is being separated from the outer world. Heaven or garden means being protected from the outer world's complexity with a visible or invisible boundary (Sanrkowicz, 2003, p. 12).

As all residential areas have its hardscape or softscape dominant gardens in their closest environment, the nature of the idea of a garden can be another instinctive reason creating borders for gardens.

As it is mentioned in the previous chapters, according to Mattern (1997), human beings, after being a hunter and/or a collector, started to tame animals and agricultural activities. Also, this changing economy steers people to have boundary elements. This is both preventing animals to run away and showing ownership of agricultural land, so it was related to the safety of goods (Uluer, 1997, p. 3)

In today's city dwellings or metropolitan areas, people no longer use their house garden as agricultural land and they don't have farm animals; however, their garden fences are mostly much higher and visually and physically impermeable. With increasing social, spatial and residential segregation, the number and power of garden borders in cities also have increased and they have become a dominant element of urban areas.

According to Kalugila (2006, p. 24), today, living between and within the fences have become such a usual way of life that people hardly notice them in their daily lives even though they are very dominant in residential sites. Fences can tell where people belong to and the ones who are the people are in relation to. They also disjoin the public and private spaces and shape community and individual's identity.

Kalugila (2006, p. 24-30) states that amongst most people, living in a house that does not have a fence is considered risky and this is giving the feeling that the building structure was not completed yet. Fences are more than vertical elements in a built environment and have functions. They exist in varieties in one's socio-economic situation, the place's residential density, and purpose of building fences and exposure to alternatives. Also, they have implications such as environmental

degradation, the effect on service provision, distortion of aesthetics of an area and blocking visual continuity of space. There is a need for creating and improving public awareness to make community members conscious about the pros and cons of varying fence types and minimum conditionality for erecting them including respect of public interest.

3.4.1 Functions and Features of Residential Garden Borders

According to Uluer (1997), the boundary elements (walls, fences, plant materials, etc.) in subscale, such as boundaries which bound buildings, has 7 basic objectives;

1. Privacy

The privacy factor is thought to be the most significant one of the boundary element objectives. Privacy covers protection for visual and physical interference. Privacy means a fully or semi-closed view, from the outside glance.

2. Safety and security

From the beginning of boundaries, protection is the first and oldest function. It is not only protecting insiders from the outsiders, but it is also for protecting and keeping people and animals out of dangerous areas.

Sometimes, permeable and semi-permeable barriers are preferred to fully strict ones because sometimes protection means to see the area. Fully impermeable areas don't allow the security guards or an outsider's eyes and aggravate to determine a crime or another threat.

3. Esthetics

The scale and form of walls and fences must be integrated and must be in harmony with the environment as they are always visible edges. The character and function of space must always be considered while using these boundary elements.

4. Identification of the limits/edges

Boundaries undertake the function of inhabitation and dissuasion. The limitation function also identifies ownership and provides protection.

5. Control of circulation

Barriers can orient and control pedestrian and vehicle traffic.

6. Control of environmental factors

A well-designed fence can control sunlight and wind. Also, it helps the climate control in a place. Snow fences, an intense plant fence for noise or malodor, etc. can be listed as important examples.

7. Creating partitions

Well-positioned curtains/coverings can create outdoor rooms while playing the role of dividing walls. They create various activity areas and make alterations in an apparent space (Uluer, 1997, p. 5-6).

The physical features of garden fences/walls;

According to Uzun (1989), whether a boundary element is functional or having a visual purpose, they are perceived in a place with a sense of form and place. They have some physical features as a requirement of their function. Because it's function can cause an effect with its physical features like scale, proportion, form, weight, etc. (Uluer, 1997, p. 8).

For appropriate physical and visual limitations, the scale of the boundary element is highly substantial. They can be solid and high or low. The function of the place

which needs some kind of protection is the basic determinant of the barrier's scale. The barrier can be under or above the eye level. However, for more visual esthetics, it is preferred to plan the barriers less than 180 cm. A wide barrier causes not only economic but also place loss. Moreover, the use of big-scale boundary elements in small places causes them to perceive the place as narrower. It is appropriate to use high barriers for large spaces and low barriers in small and narrow spaces. The scale must be designed carefully and the most important factor about it is the accordance with a human scale. The designed boundary element's weight and mass can be light; otherwise, a heavy mass structure is compared to the scale and character of the place (Uluer, 1997, p. 9).

Unity is a necessity for visual perception in any place design. The barrier must be in harmony with both the inner and outer place which it divides.

In addition to these physical features, according to Şimşek (1993) a boundary element must answer these questions;

- Does the barrier only provide esthetic features?
- Does it provide physical limitations?
- Does it provide a strong privacy feeling?
- Does it solid? Does it allow for a visual transition?
- Is it in harmony with other design elements?
- Does it have planting?
- Is it cost-effective?
- Is it easy to obtain it?
- Is the operating technique appropriate?
- Is it long-lasting?

Furthermore, a barrier must have the following features;

- It must interrupt outer effects.
- It must have a successful design.

- Harmony with the environment is significant.
- Scale and proportion concepts must be harmonious.
- The use of elements must be rhythmically based on the material and type.
- Color is important for place perception.
- Material usage must be in appropriate texture (Uluer, 1997, p. 9-10).

3.4.2 Residential Garden Border Types

Residential garden boundaries are not emphasized just with solid elements, and in different cultures, there can be various types of residential borders. For example, a ditch or water canal can be used as a border for residential sites as they were protection prevention for old cities. Natural or humanmade elevation differences between places can create borders, or like in Venice, Italy, water canals can be dividers among houses. Today, in Turkey, residential site boundaries are mostly defined with solid landscape elements.

To analyze residential garden borders in urban areas, 3 main parameters are chosen which are material of borders, height of borders and physical and visual permeability of borders. In this chapter these three parameters are reviewed respectively.

3.4.2.1 Material of borders

Uzun (1989) states that choosing the barrier as a landscape element must be addressed as a significant subject and for these studies, there are two groups as living and nonliving elements of barriers. The living elements are plants and they give a dynamic effect to the landscape in time. As they are living, they need periodic maintenance. Although the nonliving elements such as walls and fences

need maintenance less than plants, and they don't have the dynamic and esthetic effects of plants, making them more attractive for people. It is also possible to use living and nonliving elements together and provide more functionality and outcomes (Uluer, 1997, p. 8-11).

According to Uluer (1997, p.11), non-living boundary elements are walls, fences, garden doors/gates and other boundary elements such as barriers, traffic inhibitors, folding screens, and paravanes etc. In this thesis, only walls and fences are studied because garden doors are not mostly continuing elements or edges. They are mostly a spot. Also, other boundary elements are not used as a residential site garden boundary.

Booth and Hiss (2012, p. 368) state the walls and fences as a third dimension set of elements in the garden. They mention two types of walls and fences. Also, these are retaining walls and free-standing walls or fences. Retaining walls hold back a slope or upper level of ground from a lower area of ground and free-standing walls or fences are elements that stand in the landscape without the support of other structural elements. They can both be used for several functions on the residential site. Walls, fences or vertical plant materials can serve as spatial edges and screen views to create privacy, direct views, modify exposure to sun and wind and direct movement. Plant material needs time to mature and some specific environmental conditions for location and it needs more space so it is not useful to use them in limited spaces. Moreover, the walls and fences can have the functions of being an architectural extension of the house, background to other elements, unifier, visual interest of form and pattern.

3.4.2.1.1 Walls

The architectural element wall is a threshold in its location and it ties two places on that threshold (Alkaya, 2013, p. 2).

Dictionary of Architecture & Construction defines a wall as “1. a structure which serves to enclose or subdivide a building, usually presenting a continuous surface except where penetrated by doors, windows, and the like. 2. a rampart. 3. a retaining wall.” (Harris, 2006, p. 1052).

Dictionary of Landscape Architecture and Construction defines a wall as “an upright surface providing enclosure.” (Christensen, 2005, p. 403).

Walls can have various functions as and like a boundary. They can be a carrier, divider/separator, limiter, water and heat insulator, controller for noise and fire (Erdoğan, 2009, p. 147). In addition, they have the function of hiding, defense, protection from outer threats and more, depends on the place and purpose. There are various types of walls based on their form, color, texture, material, construction type (Perçin, n.d., p. 1).

Walls can be made of stone, brick, adobe, briquette, ytong, reinforced concrete, gas concrete block or panel, wood, plaster, glass, plastic and combined (Erdoğan, 2009, p. 147).

3.4.2.1.2 Fences

Dictionary of Architecture & Construction defines fence as “a barrier that defines a property line, encloses, or borders on a field, a yard, or the like.” and gives illustrations and definitions of specific types such as barbed-wire fence, board

fence, chain-link fence, picket fence, plank fence, post-and-rail fence, rail fence, split-rail fence, sunk fence, Virginia rail fence, worm fence, zigzag fence (Harris, 2006, p. 394).

Dictionary of Landscape Architecture and Construction defines fence as “an upright enclosure or barrier, such as wooden posts, wire, iron, etc., used as a boundary, means of protection, privacy, screening, or confinement, but not including hedges, shrubs, trees, other natural growth, or landforms.” (Christensen, 2005, p. 139).

Perçin (n.d., p. 23), sorts of fences and rails (a type of fence) functions in many different ways: they provide protection, define boundaries, create privacy, contribute to the aesthetics of the place, create segmentations and they decrease wind and noise. They become a skeleton for climber plants. These factors must be considered while using fences; they must be durable, compatible with its environment about material, texture, color, and form, the fence’s height must be compatible with regulations, with the environment and its functions. The fences must be parallel to the slope. Fences and railings can be wooden, iron, aluminum, plastic or concrete. The form of the fences always must be safe for people, children, and animals.

Fences are preferred because their maintenance cost is low. It is easy to assembly. They can be durable and light and they can be recycled (Perçin, n.d., p. 23).

3.4.2.1.3 Wire fences

Other commonly used nonliving boundary elements are wire fences which are thinner than regular fences and which have one hundred visual permeability. Their physical permeability can be adjusted with their height or sometimes wire fences

can be barbed, and they have 100 percent physical impermeability. It is also possible to see low height wire fences, and they can be used as elements for psychologic and defining boundary.

3.4.2.1.4 Plant borders

Plants as living boundary elements are also used both for both physical and visual permeable and impermeable borders. Plants' features such as form, leaf, height, texture provide some functions desired from a living boundary element. The plant border or fence can be formal as a wall or informal. Intended height and permeability can be obtained with the plant's features, design, and regular trimming.

For functional and aesthetic effect, two or more boundary elements combination can be used. A combination method can solve lots of problems with boundary elements. It is significantly an effective solution for the areas which need high boundaries (Uluer, 1997, p. 137).

In the thesis "The use of boundary elements in landscape applications and a search of boundary elements in İstanbul's landscape" by Uluer (1997), a survey about boundary elements in residential area is conducted. 20 participants' opinions and choices about boundary elements are collected in Levent, İstanbul. According to the analyses of the survey, 40% of participants prefer plant material, 10% prefer nonliving elements and %50 prefer a combination of living and nonliving materials as a boundary element. Participants mentioned they would only choose living materials if there weren't a concern about safety. 70% of participants state that boundary elements make them feel psychologically calm and relaxed and %30 remark that they feel uncomfortable about them. They emphasized that if the boundary element is made of a plant and if it is not very high, it makes them feel

more relaxed. Participants mentioned their priorities on their need for boundaries, and these are safety and security respectively, defining the boundaries, controlling the environmental factors such as wind, sunlight, noise and finally privacy. If participants decided and constructed their own garden's boundary element, they mentioned that they pay attention to durability, price, and esthetics of it (Uluer, 1997, p. 170-176).

3.4.2.2 Height of Borders

Uluer (1997, p. 53-55) mentioned 3 types of walls based on their height, which are high, medium height and low walls. High walls are higher than eye level and they are used as a physical and visual barrier. Medium height walls are lower than eye level and they are used for the partial enclosure. These walls allow visual permanence. Low walls are generally used as a physical barrier to indicate a border. Identifying an area, dividing different usages and textures and without a strict physical and visual barrier, low walls create psychologic boundaries.

Booth and Hiss (2012, 375) mention 9 different wall/fence heights and their uses.

243.84 cm (8' - 0") borders are mentioned as interior wall height and they provide high privacy and often need zoning variance (Figure 3.10 (1)).

213.36 cm (7' - 0") borders are mentioned as a good exterior wall height. They also construct high privacy and might need zoning variance (Figure 3.10 (2)).

182.88 cm (6' - 0") borders are common fence height and provide adequate privacy except for tall people (Figure 3.10 (3)).

152.4 cm (5' - 0") borders are at chin height of an average adult. They create a semi-private area but enough privacy is seated (Figure 3.10 (4)).

121.92 cm (4' - 0") borders are at chest height of an average adult. It is like separation and doesn't provide privacy. These walls create ledges to rest elbows while conversations with neighbors (Figure 3.10 (5)).

91.44 cm (3'- 0") borders are at kitchen counter height. They also create separation and doesn't provide privacy. They have a wide cap that serves as a counter or ledge for pots (Figure 3.10 (6)).

76.2 cm (2'- 6") borders are at table height. They give separation and no privacy. They can be used as a potential counter or high seat (Figure 3.10 (7)).

60.96 cm (2'- 0") borders are too low for the tabletop. They provide a slight separation and a good seat height (Figure 3.10 (8)).

45.72 cm (1'- 6") borders are at common bench height. They provide minimal separation and ledge for pots or cushions (Figure 3.10 (9)) (Booth and Hiss, 2012, p. 375).

For the height of walls or fences, there are no admitted standards. Every district can have its regulations for it. In this study, the heights are standardized as in the following.

In Neufert (2012, p. 29), the standard height for a human is 175 cm. It can be specified that high walls are higher than 175 cm, and for medium and low walls the average height can be divided to 2 and it can be specified lower than 90 cm ($175/2=87.5 \sim 90$) is low walls and between 90 cm and 175 cm can be middle walls.

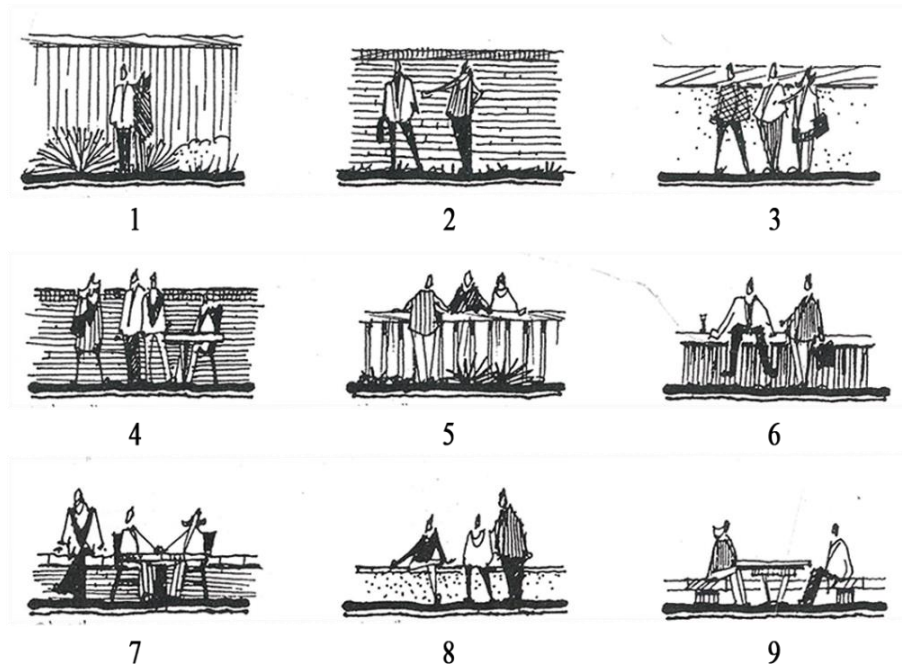


Figure 3.10 Different wall heights (Booth and Hiss, 2012, p.375)

A research which is investigated in Dar Es Selaam (Tanzania) with 10 respondents by Kalugila (2006, p. 26) it is founded that 50% of observers of the boundaries from the street said that high and solid fences created a sense of fear, while the others remarked their feeling of claustrophobia when passing through a street with high fences. They stated that the adverse feelings increase in the late evenings and nights because most gates were then closed and there was no light.

This data shows that high boundaries around houses block the light that comes from residential or their gardens, and it also affects people's perception and feelings.

However, solidness is not only about the height of borders but it is also related to permeability that the following chapter explains.

3.4.2.3 Visual and Physical Permeability

Boundary elements in residential sites can also be designed to provide varying degrees of openness. They can give opportunities for viewing beyond, by allowing vertical planes to have openings in them. As interior wall windows, outside walls can also have them. The degree of transparency can be provided with material or with openness. The smaller the open pattern, the lower the percentage of openness in the fence. While walls/fences provide enclosure, windows or voids on them provide views and light enters the space and prevents people from feeling too enclosed (Booth and Hiss, 2012, p. 375-377).

Booth and Hiss (2012, p. 376) classifies percentage of openness depends on the amount of solid area versus open area in Figure 3.11.

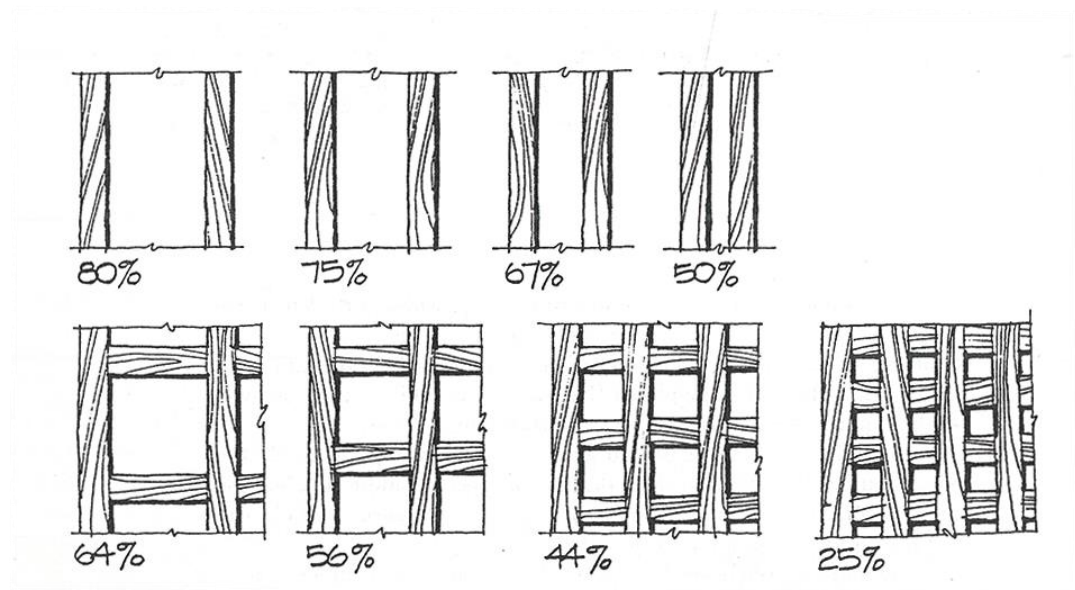


Figure 3.11 Visual permeability percentages (Booth and Hiss, 2012, p. 376)

If there are no walls, other variables such as rituals, time, smell, light etc. show up as a boundary (Alkaya, 2015, p. 8). These factors may not provide 100% physical

impermeability, but they can provide semi-permeable areas with their effect. For example, a dark area can give people the feeling of fear and they can avoid being inside or a bad odor can keep people away.

Preferred visual permeability level can be provided with the height and scale of the barrier, the transparency of barrier, the breaks on the barrier, material of the barrier.

The physical permeability of a site or a border is about its allowance of the transition of pedestrians or vehicles. A site can be physically permeable and let pedestrians and/or vehicles for transition or using the area actively. For %100 physical permeability, there must be no borders or written signs that say 'no strangers/the area belongs to someone/something'. Sometimes, even if there are no borders or no written signs, if an area is well defined, it can be given a feeling of private area and make people stay far from there. This is also related to the perception of people. If a site has borders in any height and any material, it is perceived the site is physically impermeable. If a site is without borders but has written warning signs, it is also physically impermeable. While creating impermeability can be effortless, it can be provided with high walls, barbed wires, controlled gates with pin codes, or security guards. In this thesis, the easiness of exceeding the border and reaching the site is ignored, and if a site is with a border in any height and material or if there is a written sign, the site is counted as impermeable.

A barrier that has 100 percent visual permeability can be 100 percent impermeable on physicalism. Barbed wires can be an example of it. Otherwise, a physically permeable barrier cannot allow visual permeability. For example, a high, solid-walled barrier can have a tiny and narrow uncontrolled door that allows physical transition, but it doesn't let people see what is inside.

Kalugila (2006, p. 27) mentions 3 different fences in residential sites based on their visual permeability. A fully enclosed boundary, like a solid wall, gives the feeling of a dead, lonely and ghost street. It has a little or no link between public and private space. Also, in the areas with fully enclosed boundaries, there is a lack of or very weak street life. The other type is partially enclosed boundaries which can be perforated blocks or metals. This kind of fence fairly links between public and private space. It gives a sense of invitation to public and private space and a fair chance of street life. Moreover, transparent material boundaries such as a wire mesh or chain doesn't obstruct the continuity between public and private spaces and it provides an intensively active street life.

Visual and physical permeability preferences can change with desired safety need. While some people feel safe with high and impermeable walls, some can find permeable borders safe and spacious.

In this third chapter, boundaries are examined in the urban design context. In the first subchapter, public and private spaces and the place of boundaries in urban areas are defined. Then, urban design objectives are studied in detail, and the boundary concept is investigated in these objectives. As boundary concept must be studied multi-scalar, examples of urban design review guidelines about boundaries of abroad are investigated. In the last subchapter, the residential site's boundaries' or borders' functions and features are defined, and four parameters that were studied in this thesis are explained in detail.

CHAPTER 4

RESEARCH METODOLOGY

The thesis utilizes a case study method to analyze the research questions which are;

- How much the boundaries and physical borders meet these in today's residential sites?
- How do their visual and physical permeability level affect urban areas?

And the sub-questions related to these two research questions are;

- What material is used the most, and what is the dominant height of borders?
- Does material and height choice affect the visual and physical permeability of borders?

Figure 4.1 demonstrates method flow chart of the thesis.

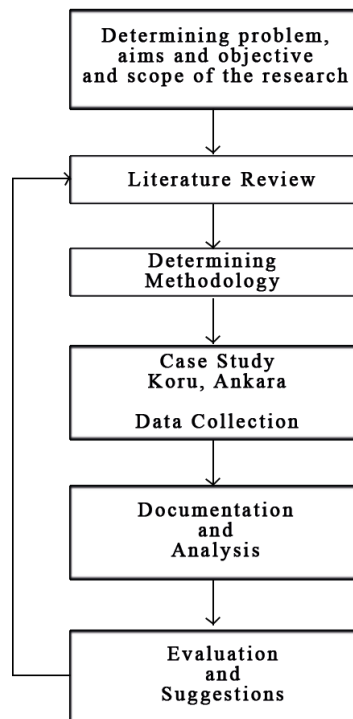


Figure 4.1 Method Flow Chart

The case area is a suburban neighborhood, Koru, in Ankara, Turkey and 52 residential site's borders in this neighborhood are multiple cases. Residential sites and other uses are intricate in city centers, and physical borders can be shaped by the impact of dense population and other urban reasons. Suburban areas are proper for analyzing residential site borders in urban context because of the intensity of the residential fields on them. In the areas which are close to the city center, residential neighborhoods are very concentric with other uses such as commercial, education, business, etc. Also, when a new residential site is built in the city center, the site and its borders are mostly shaped with different variables close to it. Suburban areas are newer settlements, and they generally have fewer physical restrictions. Because of these, a suburban area, Koru Neighborhood is chosen for the study.

Koru Neighborhood is in Ankara, Turkey, and on the 17th km of Ankara-Eskişehir highway. Further information about the neighborhood is given in the next chapter. There are 52 different single-family houses and high-rise apartment residential sites with various types of boundaries in the site. The area has been chosen for the research because of the existence of various kinds of residential sites and border types in it. Another reason is the sociocultural and economic level of people in Koru, which can be considered as homogenous. That is, the gap between social classes is not very high among residents. The socio-economic and education levels in the neighborhood are higher than the average in Ankara.

The main concern of thesis is the borders in 52 residential sites (Table 4.1) in Koru Neighborhood.

Table 4.1 52 Residential Sites of Koru Neighborhood

High-rise Apartment and Single Family House Residential Sites of Koru Neighborhood	Single-Family House Residential Sites which are not surrounded by an outer border (houses have direct connection to streets) of Koru Neighborhood
Gordion Houses	Azat Bey Residential Site
Arı Residential Site	Koru Mesa Houses
Şahin Residential Site	Seçkinler Residential Site
Birliktent Residential Site	Yeşilkent Residential Site
Beyazgül Residential Site	Uyum Residential Site
Beyazgül A-1 Residential Site	Atakent Residential Site
Beyazgül A-2 Residential Site	Mavi Kent Residential Site
Doğa Residential Site	Akşar Houses
Köknar Apartment	
Canyuva Apartment	
Özgecan Apartment	
Güzelkent Residential Site	
Koru Residential Site	
Tuğberk Residential Site	
Ema Asmabahçe Residential Site	
Arı Blocks	
Simten Residential Site	
Mütaş Residential Site	
Otuzevler Residential Site	
Oyak 7 Residential Site	
Vadikent Residential Site	
Özden Apartment	
Kilim Apartment	
Değişim Apartment	
Funda Residential Site	
Yeşil Çatı Residential Site	
Akşar Residential Site	
Yeşil Ada Residential Site	
Çelikkent-A Residential Site	
Çelikkent-B Residential Site	
Bulut Residential Site	
Toptancı Hal Residential Site	
Oyak 10 Residential Site	
Güzelçatı Residential Site	

Akçam Residential Site	
Başkent Doktorlar Çokkatlı Residential Site	
Güzeltan Residential Site	
Rüyam Residential Site	
An-90 Residential Site	
Ladin Residential Site	
Temsa Residential Site	
Çayyolu Çamlık Residential Site	
Yeşiltepe Houses	
Seçkin Emek Residential Site	
İdareciler Residential Site	

The single-family houses of 8 residential sites have direct connection to public streets, so the borders are formed regarding the personal preferences of the owners of the houses. As a consequence, these residential sites were kept out while analyzing borders. The remaining 45 residential sites which have their own physical or nonphysical boundaries are analyzed one by one in chapter 5. As Koru Residential Site has an extensive acreage and has both single-family houses and apartments, it is counted in both columns. Because single-family houses in Koru Neighborhood have their own borders based on personal preferences, and each apartment/apartment pairs has another type of boundaries. This is the reason for having 52 residential sites in Koru Neighborhood and having 53 residential sites in the list.

So as to analyze the residential site borders, various maps and photographs demonstrating the current residential border types are used, and these are evaluated with direct observations from the perspective of a landscape architect and urban designer.

The first assumption, “Residential borders do not fulfill their existence features and functions.” is tried to tested with the help of a survey for residents of these sites with different residential borders. The questionnaire was designed to ask residents of each different type of residential borders for their opinion, perception, feeling,

and, if they decided to build that type of boundary, their preference reason (safety, security, privacy, etc.) of their site boundaries. So residents' reasons for building that type of boundary could be collected for each type of boundary (height, material, permeability), and this information could be used for testing if the residential site borders fulfill their features and functions. However, because of the lack of interest by the residents of the neighborhood for answering survey questions, this survey method could not be pursued in this research, which remained as a limitation of this study. As Koru Neighborhood is a suburban area and its main land-use is residential, the public streets are not actively used by residents except in rush hours and except the places near to metro and main bus stations. When researcher asks for a survey, people refuse to answer questions by saying they don't have time and they are in hurry. This can be an indicator for neighborhood resident's introversion, lack of interest to talk with strangers and social segregation in neighborhood.

Mukhtar of Koru Neighborhood is interviewed about residential site borders and safety for gathering information about the first assumption of the study, which is about features and functions of today's residential site borders.

After analyzing the borders of 52 residential sites in terms of their height, material, as well as their visual and physical permeability, they are collected in a table with color codes to see the dominant features and understand the factors behind their use. The second assumption of this thesis, which presupposes a negative impact of impermeable residential site borders on urban areas, is tested using these data.

In the introductory chapter, the problem, research questions, assumptions, aims, and significance of the study are defined. The second chapter examines the concept of boundary and its functions and features in urban context. The chapter firstly gives information about the meaning, reasons for emergence, types and functions, and features of physical boundaries. This theoretical base helps to understand

boundaries deeply. Secondly, the relation of boundaries with social and spatial segregation, their place in the city in history and now, and gated communities in today's cities are discussed.

The third subchapter, boundaries and urban design, examines where boundaries in public and private spaces are and their relation with urban design principles such as legibility, character, continuity and enclosure, ease of movement, adaptability and quality of public realm. Boundaries of residential sites and their functions and features are also determined in this chapter and last subchapter of the fourth chapter is about the boundaries of residential sites, and the functions and types of these boundaries. Furthermore, four main parameters used to analyze residential borders which are material, height, visual and physical permeability are also given in this chapter.

In chapter 5, all residential site borders in Koru Neighborhood are analyzed one by one and collectively. Data are collected by numerous observations to the site. Also, the collocation of the residential sites is made by following the residential sites from the nearer to the city center to further. The residential sites which are next to each other or near to each other are collected alongside.

While examining the boundaries these factors are considered;

The borders lower than 90 cm are marked as low; border heights between 90 and 175 are marked as medium, and borders higher than 175 are marked as high borders. The materials are marked as if they are used in any part of the borders. It is very rare that finding consistency in all parts of the borders. However, if a material is used very rarely when compared to other materials, it is not marked. For example, a wall and wire fence border with a few ivy plants are near it.


While analyzing visual permeability, visual access to the garden of the site is considered. If the area is a single-family house site, the houses are also considered, but for apartment buildings, only garden and the first floor of the buildings are counted. If the borders of a residential site fully allow eyes inside to its close environment or garden, it is considered as visually permeable. If residential site borders allow eyes inside partly, or if it is made of deciduous plant material, it is marked as visually semi-permeable. If the borders block visual access to the site, it is marked as visually impermeable. Usually, because of topography or personal preferences, the residential sites have different visual permeability in different parts of the borders. If the permeability type is significantly dominant and if there are small exceptions, the predominant type is marked, but if there are different permeabilities on the borders, all of them are marked.

If a residential site has locked or unlocked, but closed gates, or if there are signs that claim that only residents can enter the site or there are cameras or signs that mentions cameras, the area is considered as physically impermeable. If a residential site doesn't have any signs that show where its territory is, the site is marked as physically permeable. If a residential site has defining boundaries, but at the same time, it allows or invites strangers or vehicles, it is marked as physically semi-permeable.

Color codes are used to facilitate and understand border type patterns in the neighborhood. For height green, for material blue, for visual permeability yellow and for physical permeability red color palette is used.

A presentation method for each residential site is created to show where is the location of residential site in Koru Neighborhood, how is the shape of site's boundaries, what is next to the site, and photos of the boundaries with their locations. Figure 4.1 shows the template.

THE NAME OF RESIDENTIAL SITE



the residential site's location in Koru Neighborhood

● the locations of where photos are taken

image of houses and the residential site's boundaries

borders of the residential site

Height of the border		
Low	Medium	High

Material of the border			
Wall	Fence	Wire Fence	Plant Material

Visual Permeability of the border		
Permeable	Semi-permeable	Impermeable

Physical Permeability of the border		
Permeable	Semi-permeable	Impermeable

photo of the residential site's boundaries - 1

photo of the residential site's boundaries - 2

Figure 4.2 Template of each residential site's border presentation

After collecting each residential site's borders with this temple, all residential site's borders in Koru Neighborhood are listed in a table to understand the intensity of material, height, and permeabilities of borders. With these findings and analyses, the assumptions are tested in the conclusion part. This chapter also contains shortcomings of the study and suggestions for the use of residential borders and further studies about them.

CHAPTER 5

KORU NEIGHBORHOOD

In this chapter, boundaries of every residential sites in Koru Neighborhood are investigated and analyzed to understand their effect to the neighborhood. Chapter 5.1 examines all site's borders detaily, Chapter 5.2 examines them collectively and Chapter 5.3 analyzes their features and functions.

5.1 Residential Site's Borders in Koru Neighborhood

The case neighborhood Koru is a suburb of Ankara City, which is the capital of the Turkish Republic. Figure 5.1 shows Ankara's location in the country.



Figure 5.1 Ankara, Turkey

On 13 October 1923, Ankara was officially declared as the capital of Turkey. Before that, according to Ghadimkhani (2011, p. 72) it was a small Anatolian town,

and with the construction of railway in 1892, Ankara gained economic and social significance. Furthermore, after being the capital, business, managerial, manufacture, and service facilities started to develop in the city.

Between 1950 and 1970, with industrial development, migration from rural to Ankara and population is highly increased. It is caused illegal housing and informal jobs. Squatter developments started to dominate the city center. According to Çakan (2004), starting from the late 1980s, with private car-oriented transportation, development of shopping malls, and decentralization policies, the residential sites started to sprawl, and suburban developments appeared. Ankara's development is along East and West direction, and residential developments for high-income groups appeared in this suburban sprawl located in the West and South corridors of Ankara. With new settlements and centers, the CBD of Ankara has extended along the West corridor, Eskişehir road (Ghadimkhani, 2011, p. 72-73)

Ankara is historically developed in four periods, which are Lörcher Plan Period, Jansen Plan Period, Yücel-Uybadin Plan Period, and the period covering 1990 Ankara Master Plan and after these, to master plans are prepared which are 2015 master plan and 2025 master plan. 2015 master plan (Figure 5.3) proposed policy and principles for the macro form of the city (Sarıkulak, 2013, p. 54-75).

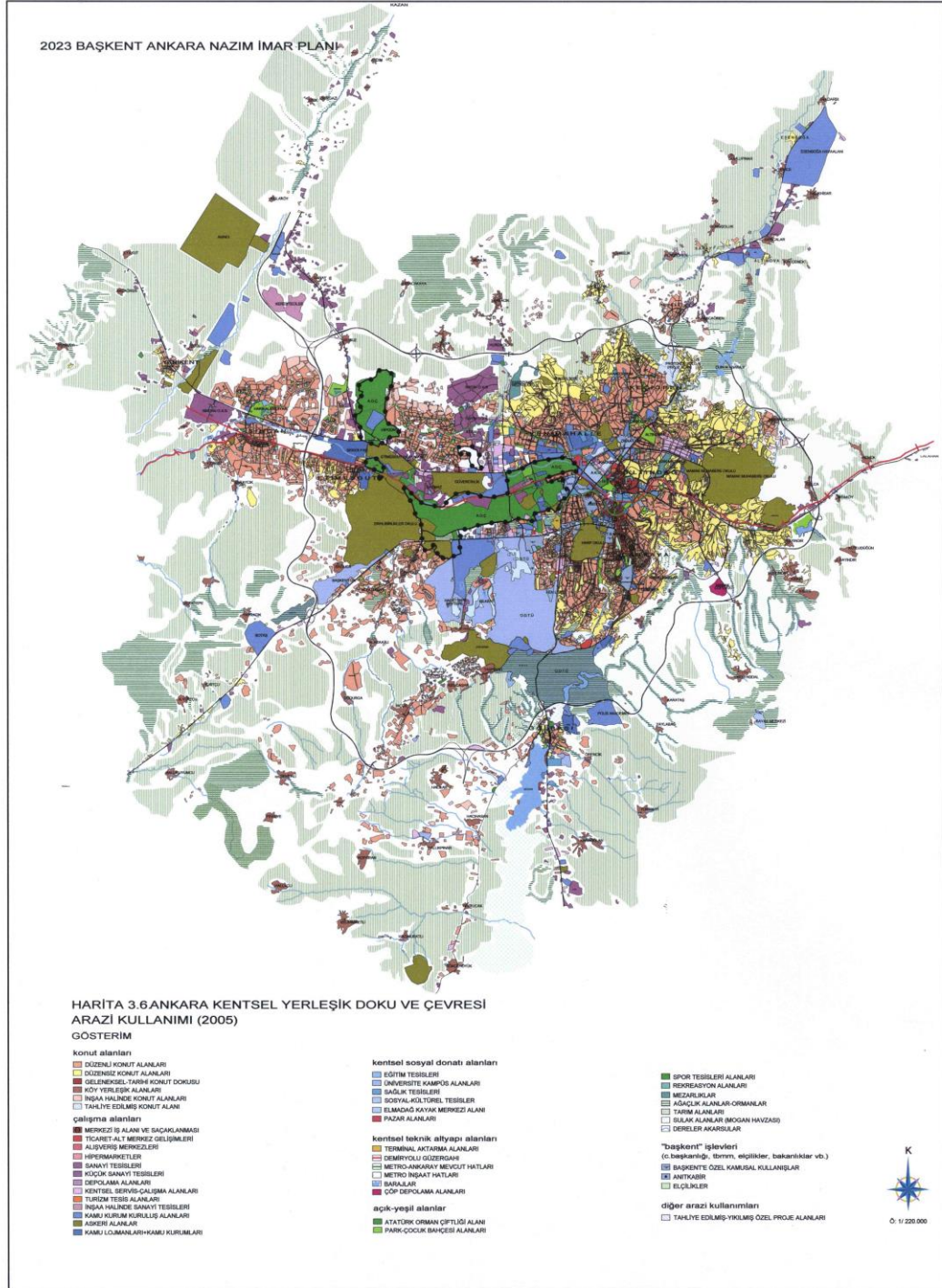


Figure 5.2 2005 Ankara Land Use, Built-in Fabric and Environment Plan (“2023 Başkent Ankara”, 2017)

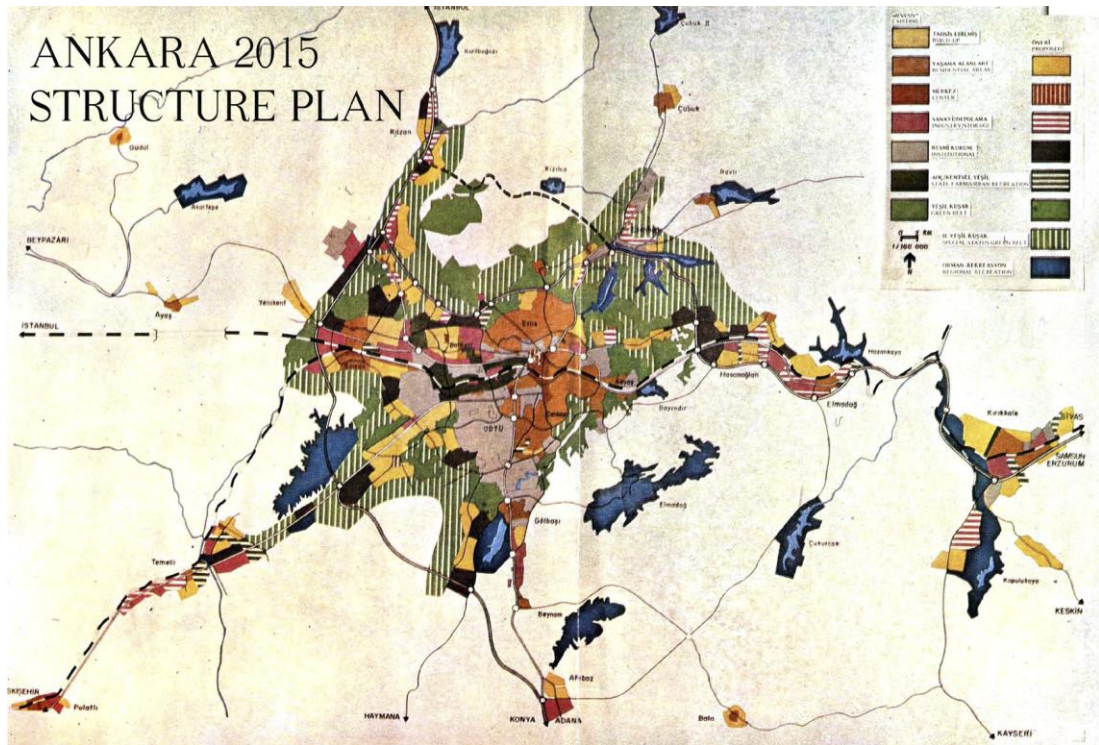


Figure 5.3 2015 Structure Plan (Resource: Baykan Günay's archive) (Sarıkulak, 2013)

Ankara has a growing population and today (in 2020) its population is 5.723.662. After İstanbul, it is the second most crowded city in Turkey, its population density is 222/km² and % 6,78 of the country's population are living in this city ("Ankara Nüfus", 2020)

The case study site is Koru Neighborhood (Figure 5.5), which is a suburban area in the west part of Ankara (Figure 5.4). It is located on the 17th km of Ankara-Eskişehir highway.

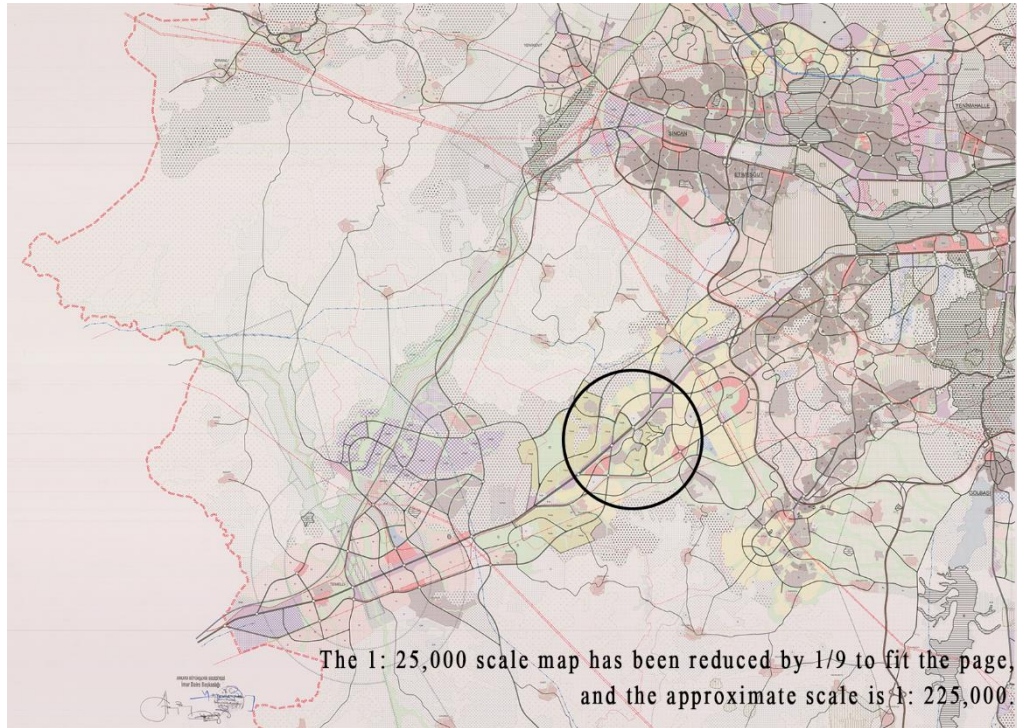


Figure 5.4 Center-west of Ankara and Koru Neighborhood (“2023 Başkent Ankara Nazım İmar Planı”, 2013)

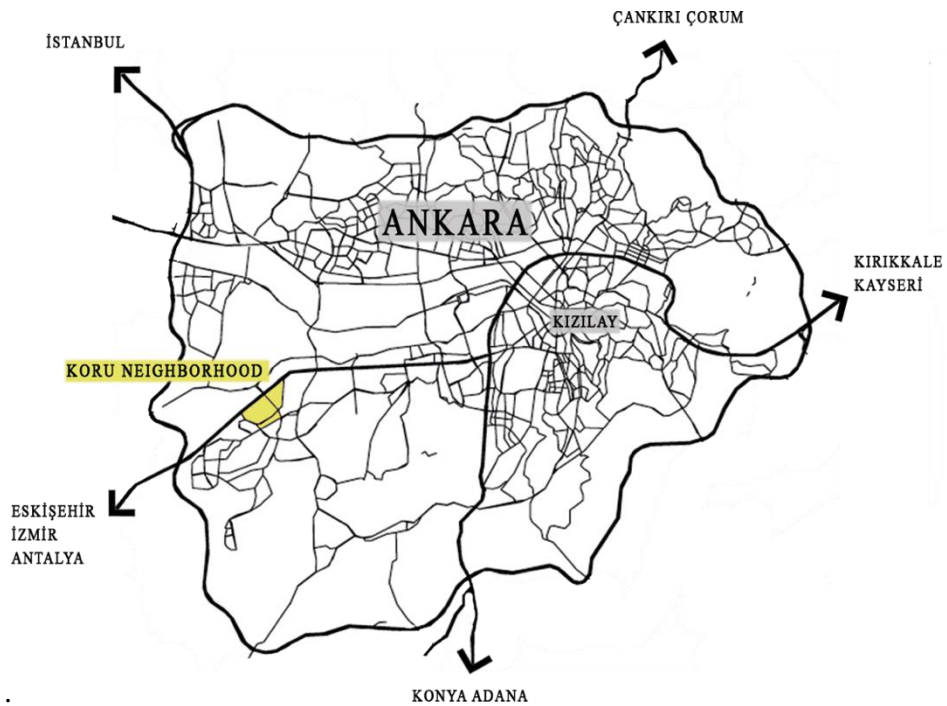


Figure 5.5 Koru Neighborhood in Ankara

Koru Neighborhood is a part of Çankaya Municipality of Ankara since 2012; before that, it was in Yenimahalle Municipality. It has 14.683 population, and in the last ten years, there has been no increase or decrease of more than 540, so it can be said that the population of Koru neighborhood is stable (“Koru Mahallesi” 2019). The residents are from the middle-high income group as the neighborhood is on the west corridor of Ankara.

Before the Mesa Koru Residential Site’s construction, Koru Neighborhood was far away from the city center, and public transportation was problematic, however, now Koru Neighborhood is a busy point with metro stations. (Vural, 2017, p. 59) Kızılay – Koru metro line was opened in 2014, and the Koru metro station became a transfer stop for different ring buses.

Figure 5.6 shows satellite image of Koru Neighborhood and Figure 5.7 shows the location of the metro station, boundaries of Koru Neighborhood, high-rise apartments and single-family houses and their sites, boundaries of each residential sites, shopping malls, educational buildings, public green areas in Koru Neighborhood.



Approx. 1:200

Figure 5.6 Satellite image of Koru Neighborhood



Figure 5.7 Map of Koru Neighborhood

There are 52 residential sites (see Table 4.1) with boundaries in Kuru; however not all of them have physical borders. Moreover, Azat Bey Residential Site, Kuru Mesa Houses, Seçkinler Residential Site, Yeşilkent Residential Site, Uyum Residential Site, Atakent Residential Site, Mavi Kent Residential Site and Akşar Houses don't have an outer border that surrounds all houses, they have single family houses which have direct connection to public streets. So, the users of these single-family houses mostly decide their own borders by themselves. At the end of this chapter, short information about these single-family houses borders are given. The borders of other 45 residential site are examined one by one about their height, material, visual and physical permeability to understand their effect on the neighborhood.

5.1.1 Gordion Houses

Gordion Houses (Figure 5.9) was built in 2010, later than all other residential sites in Koru, and it is a gated community. It has high garden borders. The side which is next to the main street has wall and glass fence borders, and on the backside of these borders, some plants create a partly visual barrier. In the backside of the site, a short wall is used to retain and the borders are made of wall, wire fence and barbed wire fences. It also has plant material in some parts of the border. The borders are visually permeable and semi-permeable. However, the site is very large and higher than the street level, so the garden cannot be seen. The site is physically impermeable.

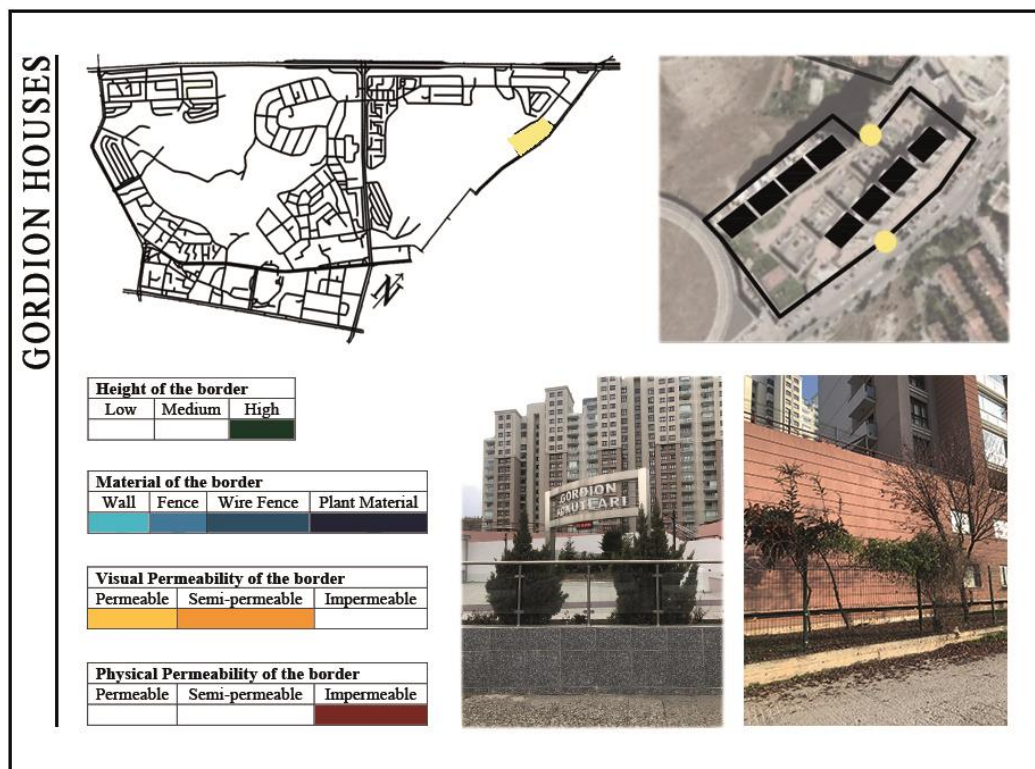


Figure 5.9 Boundaries of Gordion Houses

5.1.2 Arı Residential Site

Arı Residential Site (Figure 5.10) has high borders, and these borders are made of wall, fence, and electric wire fence. It also has plant material in some parts of the border. The borders are visually semi-permeable and impermeable, and physically impermeable.

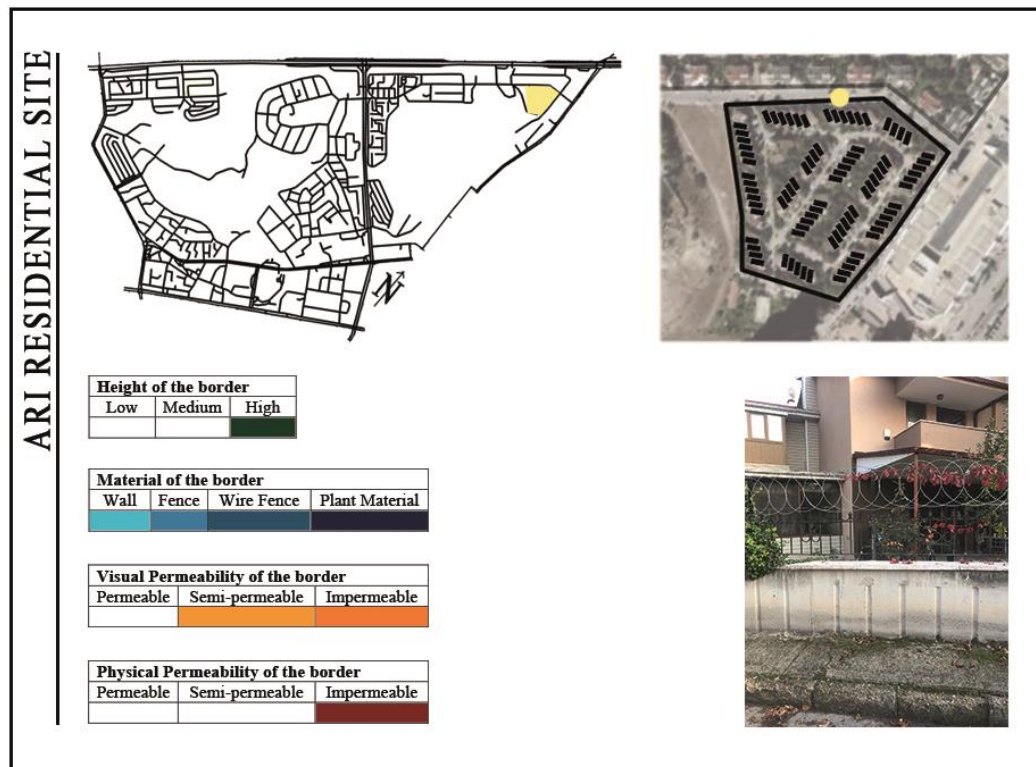


Figure 5.10 Boundaries of Arı Residential Site

5.1.3 Şahin Residential Site

Şahin Residential Site (Figure 5.11) has high garden borders. The materials used in the borders are wall, wire fence, and partly plant material. In some parts, walls are used for retailing, and in these areas, the height of the border increases. The borders of the site are visually permeable and semi-permeable and physically impermeable. Actually, in some parts of the borders, there are open gates, but the high walls also create a physiological effect, and people don't use the area for transition or recreation. Also, the road for vehicles doesn't have a gate or guard to protect the site, but the entrance is at the backside of the site, and the site's name is written in the entrance, so it also keeps people and other vehicles away using signs.

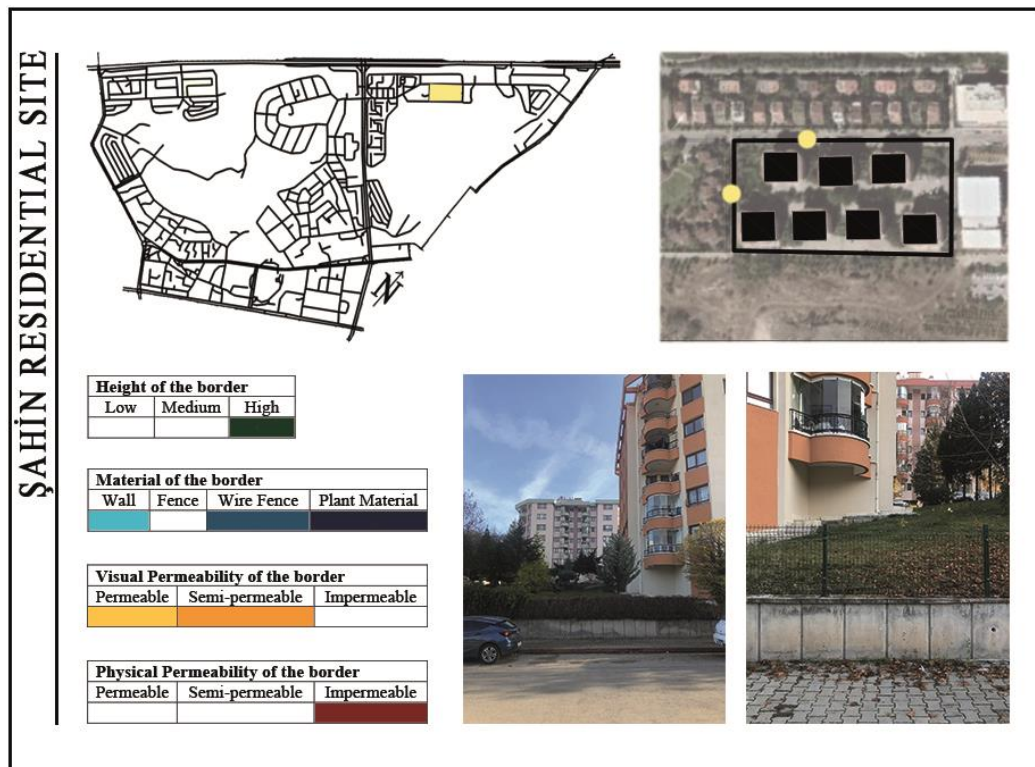


Figure 5.11 Boundaries of Şahin Residential Site

5.1.4 Birlikkent Residential Site

Birlikkent Residential Site (Figure 5.12) has medium and high borders. The material used in borders are wall, fence and in the back-side wall and wired fence. Moreover, there is partly plant material, in both sides. The site is visually semi-permeable and physically impermeable. Even the residents can get in the area by entering a security code.

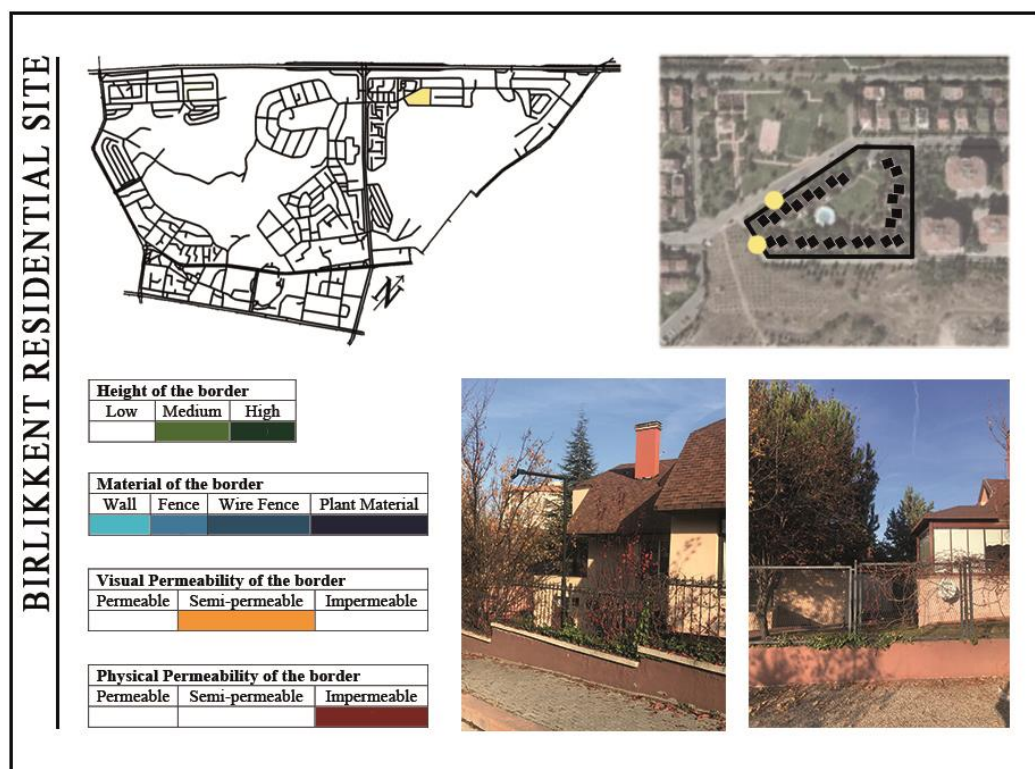


Figure 5.12 Boundaries of Birlikkent Residential Site

5.1.5 Beyazgül Residential Site

Beyazgül Residential Site's (Figure 5.13) borders highly shaped by the topography. It has mostly high and sometimes medium height and wall, fence, and plant material borders. The wall is 20 cm tall in some parts and 5-6 meters in other parts. The borders are mostly visually semi-permeable, but there are also impermeable and permeable parts as an effect of the topography. The borders have open gates, but only residents are allowed to use them, so they are physically impermeable.

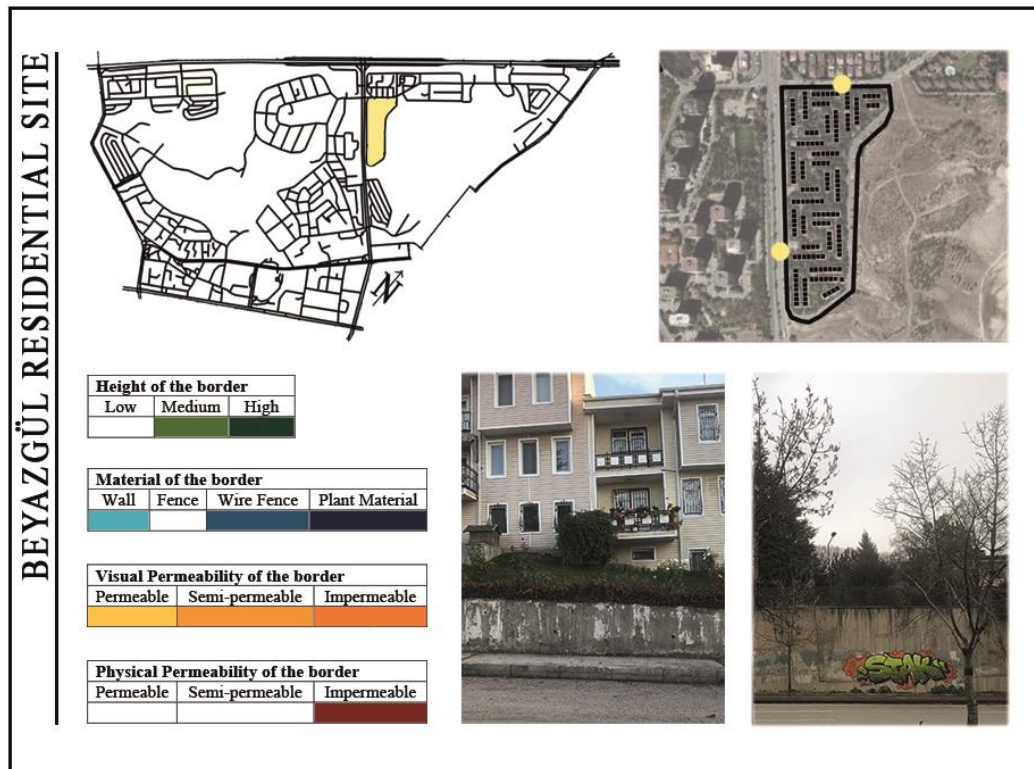


Figure 5.13 Boundaries of Beyazgül Residential Site

5.1.6 Beyazgül A-1 Residential Site

Beyazgül A-1 Residential Site (Figure 5.14) has medium and high borders. Fences and thick plant materials are used, so visual permeability is limited. There are both visually permeable, semi-permeable and impermeable parts. It has security cameras, and although the small gates on the borders are unlocked, it is allowed to enter only for the residents, so the area is physically impermeable.

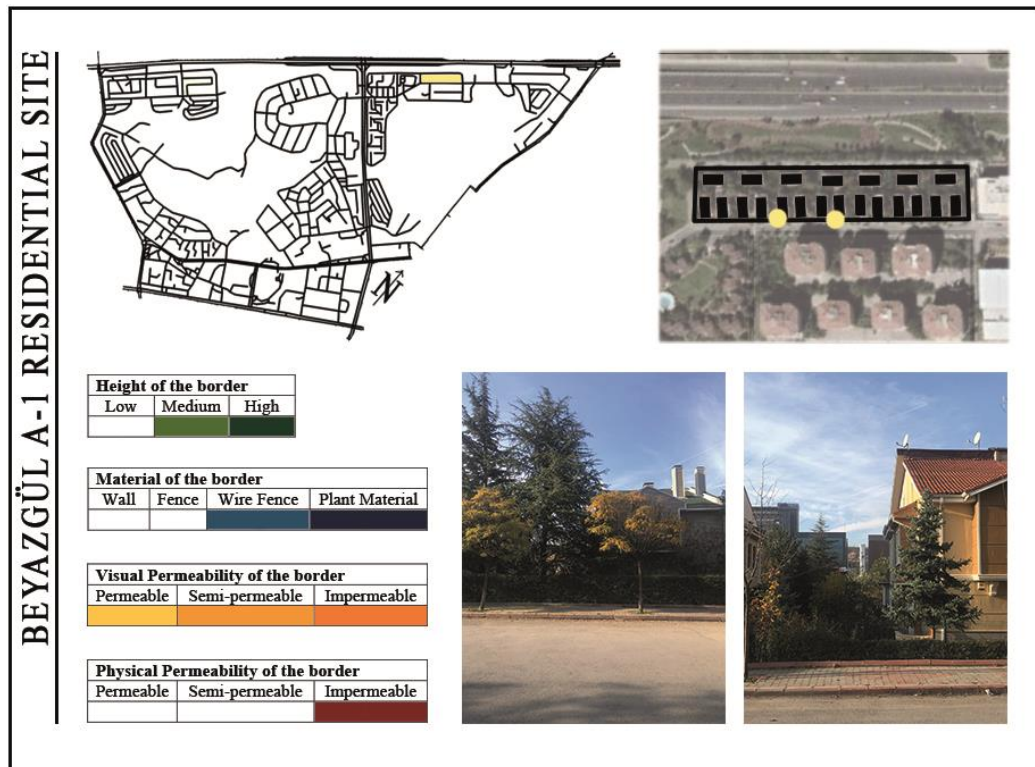


Figure 5.14 Boundaries of Beyazgül A-1 Residential Site

5.1.7 Beyazgül A-2 Residential Site

Beyazgül A-2 Residential Site (Figure 5.15) has medium height borders. They are made of plant material and in some parts, wire fence is used. They are visually and physically impermeable.



Figure 5.15 Boundaries of Beyazgül A-2 Residential Site

5.1.8 Doğa Residential Site

Doğa Residential Site (Figure 5.16) has medium height wire fence, and sometimes both wire fence and plant material borders are used. The fences are visually permeable and semi-permeable and physically impermeable.



Figure 5.16 Boundaries of Doğa Residential Site

5.1.9 Köknar Apartment

Köknar Apartment's site (Figure 5.17) has medium height and thick plant borders. They are visually and physically impermeable.



Figure 5.17 Boundaries of Köknar Apartment

5.1.10 Canyuva Apartment

Canyuva Apartment's site (Figure 5.18) has a medium height, plant material borders next to the main street and the site has medium height, wall, wire fence, and plant material borders in the backside. The site is visually semi-permeable and impermeable and physically impermeable.



Figure 5.18 Boundaries of Canyuva Apartment

5.1.11 Özgecan Apartment

Özgecan Apartment's site (Figure 5.19) has a high, wall, wire fence and plant material borders next to the main street. On the backside, the height of the border is medium, wall and plant material. The borders are visually impermeable and, in some parts, semi-permeable and physically impermeable.

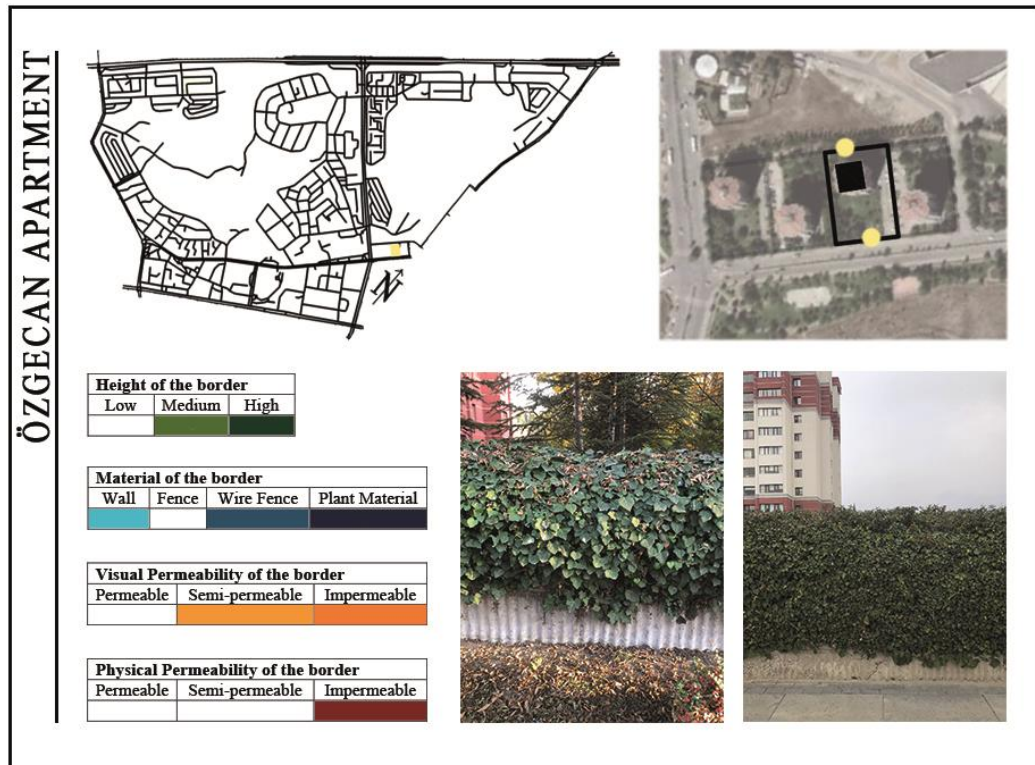


Figure 5.19 Boundaries of Özgecan Apartment

5.1.12 Güzelkent Residential Site/Apartment

Güzelkent Residential Apartment (Figure 5.20) has borders which are high are made of wall, wire fence, and in some parts, plant material. They are visually permeable and physically impermeable. The other side of the site, which is next to the main street, has a medium height, wall and plant material, and visually impermeable border.



Figure 5.20 Boundaries of Güzelkent Apartment

5.1.13 Koru Residential Site

Koru Residential Site (Figure 5.21) started as an initiation in the second part of 1970s, and the first stage started to be built-in 1982 by Mesa. The site is 460 000 m² and made for mainly high and middle-high income groups. Twenty-two block apartments with 1650 houses and 293 attached, detached, or row houses were built 22 years ago. According to Egemen (2007), before Mesa's property, the site was deprived of natural vegetative cover, and the plants were damaged because of rain and wind erosion. Mesa's aim was to create a nursery and starting to generate plants, and with other applications that supported the landscape, Koru Residential Site advocates protecting nature in this age of housing invasion. Koru Residential Site also has a different kinds of management styles that changed in years. Today most of the site is managed and maintained by a private cooperation (Aslan, 2007, p. 28-30).



Figure 5.21 Koru Residential Site (Aslan, 2007, p.24)

The apartments in Koru Residential Site (Figure 5.22) mostly don't have any boundary elements, but there are some which are mainly used as an identifier of the apartment's site, or they are used as an emphasize of the apartment entrance. These borders are low or medium height. Mostly plant material is used, and they are visually and physically fully permeable. The safety and security of Koru Residential Site are provided by private guards. There are security kiosks in some specific points of the area. Although the site is physically permeable, sometimes these security kiosks create a perturbation and keep strangers away.

In some parts, next to the main street, there are high, wire fence and plant material, visually and physically impermeable borders, which are used for blocking noise and air pollution, but the site is fully permeable from the inner side.

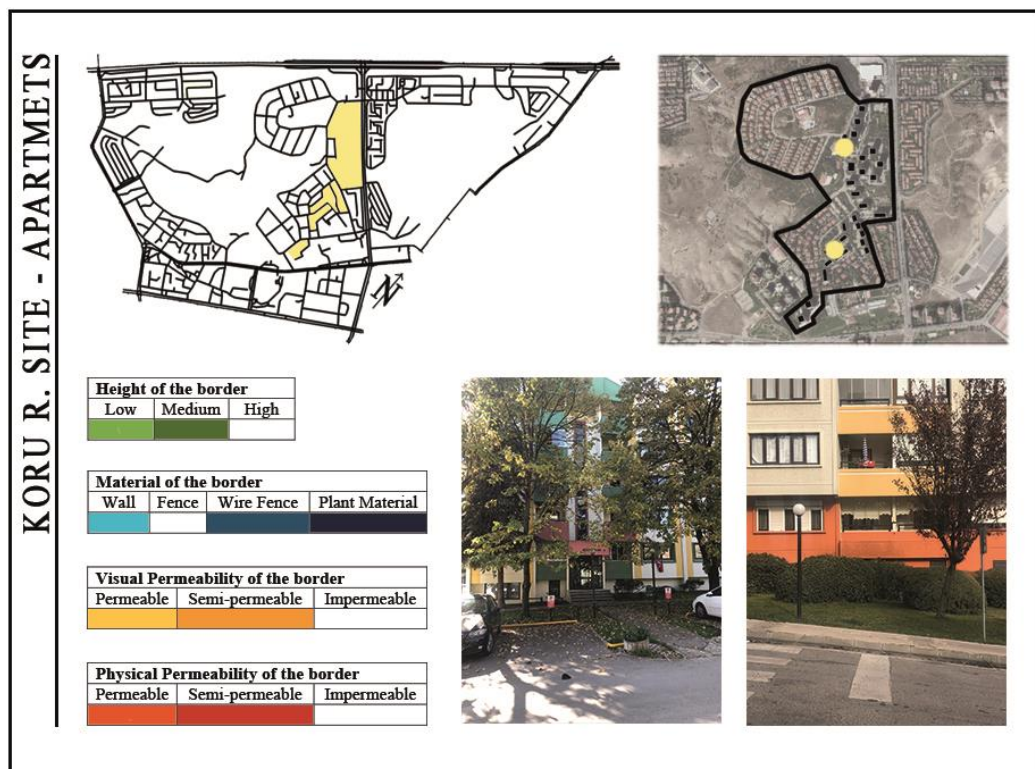


Figure 5.22 Boundaries of Apartments of Koru Residential Site

5.1.14 Tuğberk Residential Site

Tuğberk Residential Site (Figure 5.23) has a medium height, wire fence, and plant material borders on the side next to the main street. They are visually semi-permeable and sometimes impermeable or physically impermeable. However, the other side of Tuğberk Residential Site doesn't have a closed border, and the single-family houses have their own low borders, or they don't have any barriers.



Figure 5.23 Boundaries of Tuğberk Residential Site

5.1.15 Ema Asmabahçe Residential Site

Ema Asmabahçe Residential Site (Figure 5.24) is a gated community. The borders are high, and they are made of wall, fence, and thick plant material. These materials make the borders visually and physically impermeable.

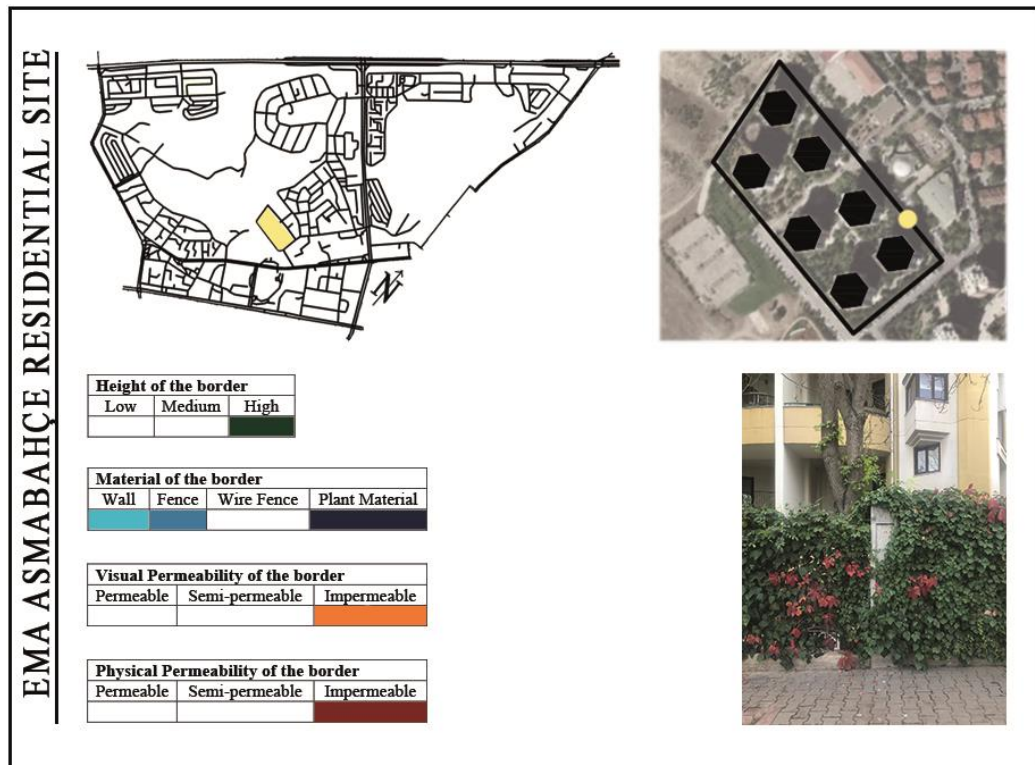


Figure 5.24 Boundaries of Ema Asmabahçe Residential Site

5.1.16 Arı Blocks

There is an inner street between Arı Blocks (Figure 5.25) and Simten Residential Site and Mutaş and Otuzevler Residential Site. This street is under the use of only residents of these residential sites. Arı Blocks and Simten Residential Site use their inner space as a consociate parking lot. While they have different materials in their outer borders, there is no border between these residential sites. Arı Blocks' borders are shaped by the topography. The site has both low, medium and high borders. They are made of wall, fence, and thick plant material. While there is an inconsistency in height, the material provides unity along the border. Plant material is not used in some parts, so the site is in some parts visually impermeable and sometimes permeable, and the site is physically impermeable. These borders do not continue in the inner side of the site. Instead of borders, there are discontinuous plants.

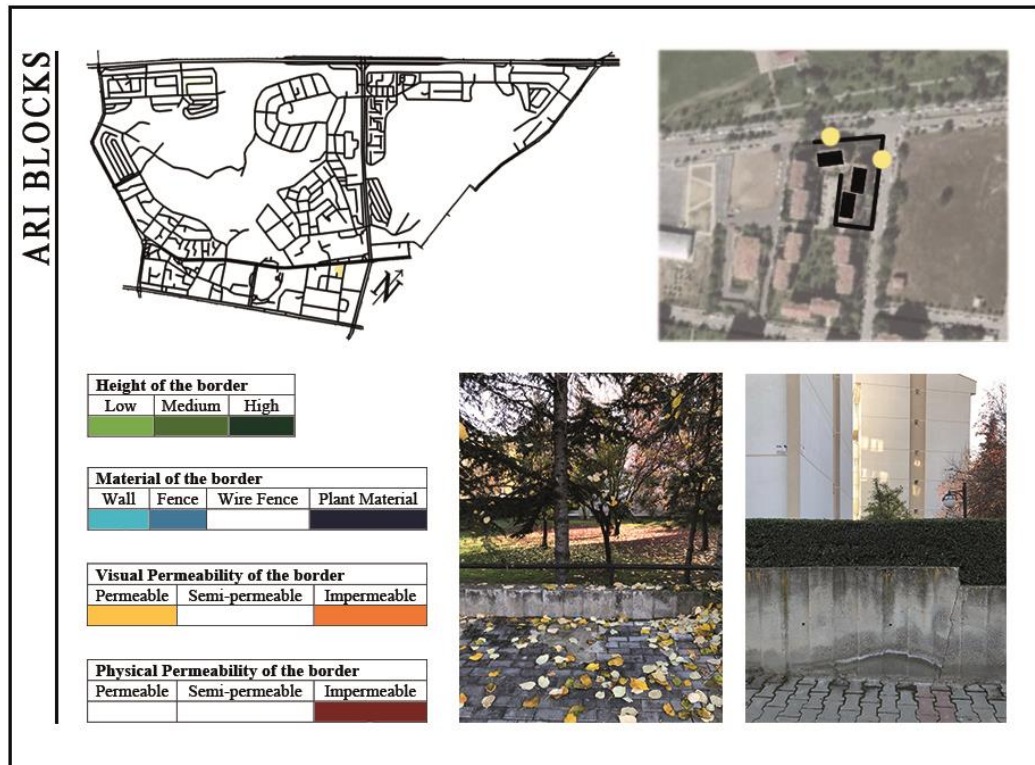


Figure 5.25 Boundaries of Arı Blocks

5.1.17 Simten Residential Site

Simten Residential Site (Figure 5.26) has medium height, wall, and plant material borders. It is visually and physically impermeable. Also, in the inner side, Simten Residential Site has fence and plant borders.

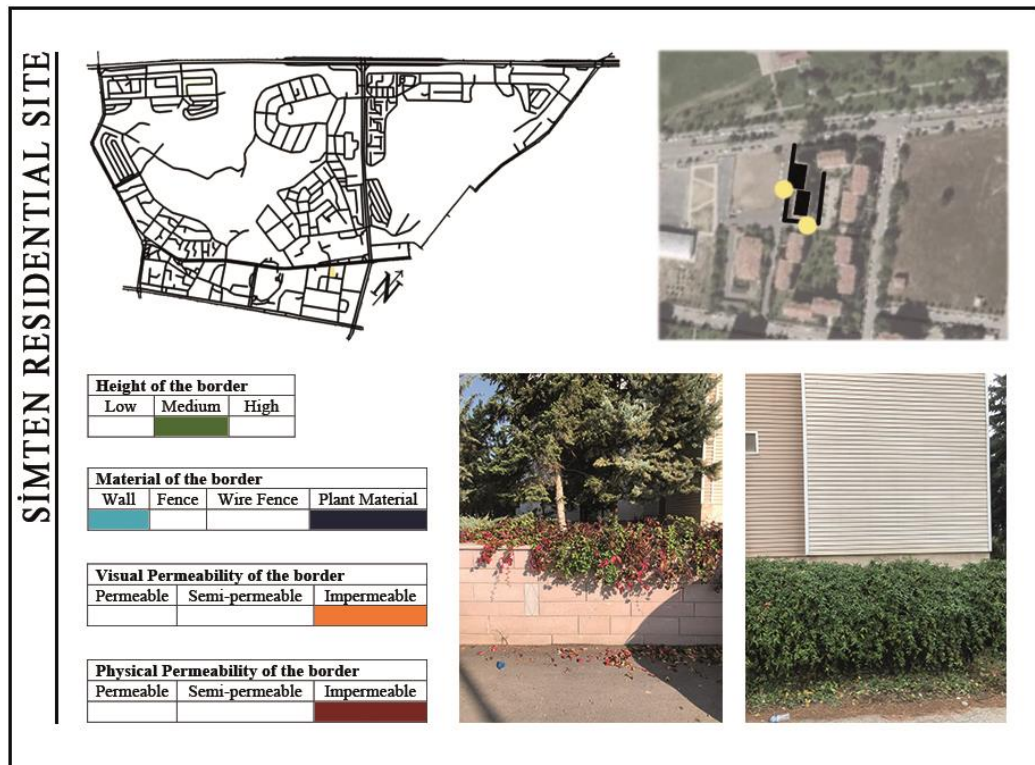


Figure 5.26 Boundaries of Simten Residential Site

5.1.18 Mūtař Residential Site

Mūtař Residential Site (Figure 5.27) is sharing its garden with Otuzevler Residential Site. The borders of Mūtař Residential Site are low height, and it is made of wall and fence. Rarely, plant material accompanies them. They are totally visually permeable and physically impermeable. The site doesn't contain any inner roads, and the inner part is only an open green space.



Figure 5.27 Boundaries of Mūtař Residential Site

5.1.19 Otuzevler Residential Site

Otuzevler Residential Site (Figure 5.28) is sharing its garden with Mutaş Residential Site. The borders of Otuzevler Residential Site are low in height, and it is made of wall and fence. They are visually permeable and physically impermeable. The site doesn't contain any inner roads, and the inner part is only an open green space.



Figure 5.28 Boundaries of Otuzevler Residential Site

5.1.20 Oyak 7 Residential Site

Oyak 7 Residential Site (Figure 5.29) has medium height, wall, wire fence, and plant material borders. They are visually semi-permeable and impermeable, in some parts, fully permeable. There are unlocked gates but warnings of cameras, so they are only in use of residents, and the borders are physically impermeable.



Figure 5.29 Boundaries of Oyak-7 Residential Site

5.1.21 Vadikent Residential Site

Vadikent Residential Site (Figure 5.30) has changing height, material, and permeability of borders. The height of borders is generally medium; however, in some parts, they are quite high. The height is higher on the parts which are next to the main street. Wall, wire fence, and plant material are used in different densities. The borders next to the main street are made of fence and thick plant material. It provides visual borders and impermeability, but some parts of the borders are semi permeable. Walls' texture and height and wire fence's material also vary in different parts of the site's borders. The site is physically impermeable despite the open gate next to main street.

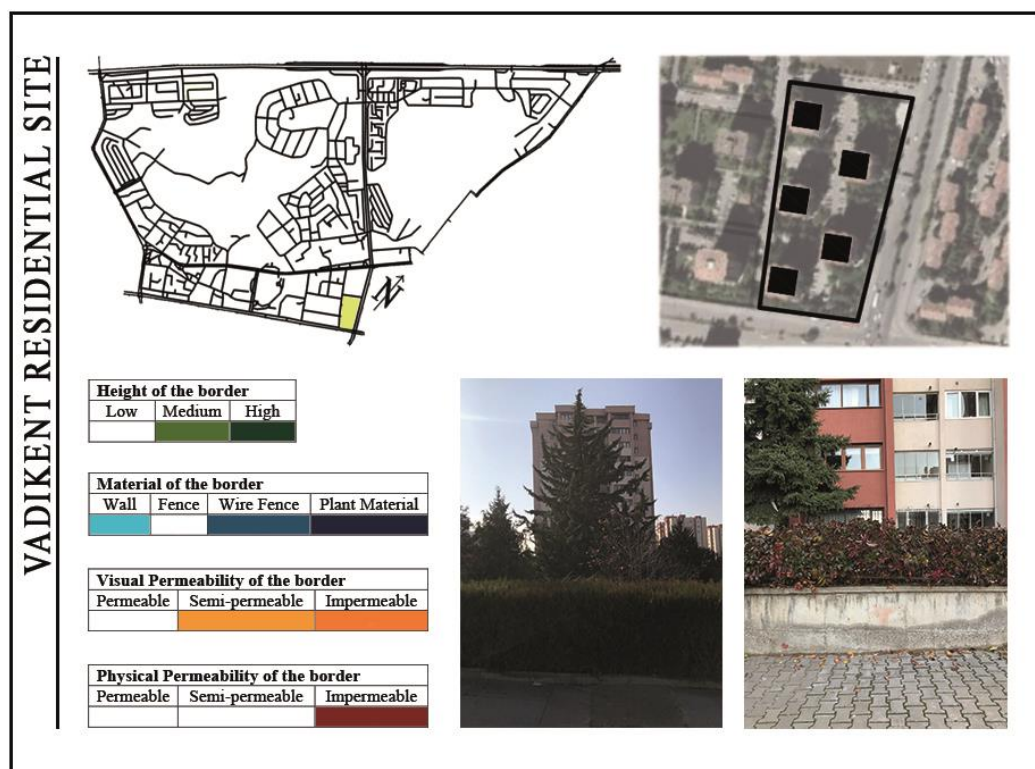


Figure 5.30 Boundaries of Vadikent Residential Site

5.1.22 Özden Apartment

Özden Apartment (Figure 5.31) has high and evergreen, thick plant material borders next to the main street. This part is visually impermeable. The backside has medium height, wire fence, and plant borders. They are visually semi-permeable because of deciduous plant material. The site is physically impermeable.



Figure 5.31 Boundaries of Özden Apartment

5.1.23 Kilim Apartment

Kilim Apartment (Figure 5.32) has medium height borders which are made of wall, wire fence, and plant material. It is visually semi-permeable and impermeable and physically impermeable.



Figure 5.32 Boundaries of Kilim Apartment

5.1.24 Değişim Apartment

Değişim Apartment (Figure 5.33) has medium height borders in the inner part and high borders in the part next to the main street. The borders are made of wall, wire fence, and plant. The part next to the main street has thick plant material, and it is visually impermeable. The part next to the inner street is visually semi-permeable. Değişim Apartment's garden is physically impermeable.

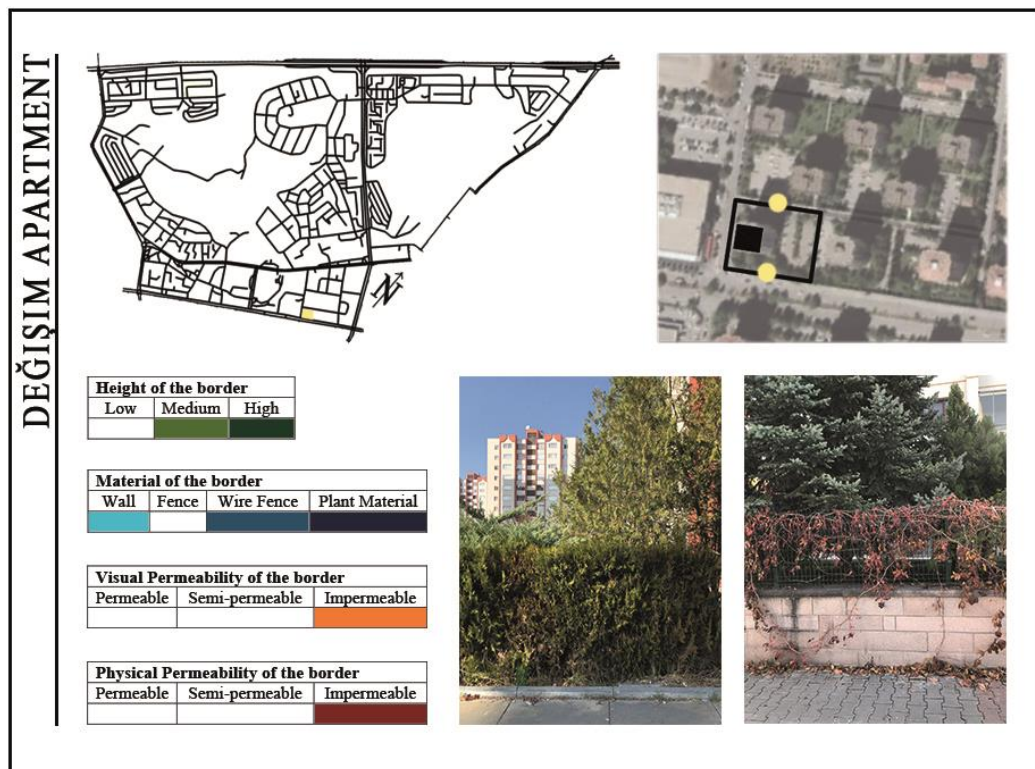


Figure 5.33 Boundaries of Değişim Apartment

5.1.25 Funda Residential Site

The site is adjacent to Yeşil Çatı Residential Site. Funda Residential Site (Figure 5.34) has medium height, wire fence, and plant borders. They have both visually permeable, semi-permeable, and impermeable parts. The site is physically impermeable.



Figure 5.34 Boundaries of Funda Residential Site

5.1.26 Yeşil Çatı Residential Site

The site (Figure 5.35) is adjacent to Funda Residential Site. It has medium height, wired fence, visually permeable, and physically impermeable borders.

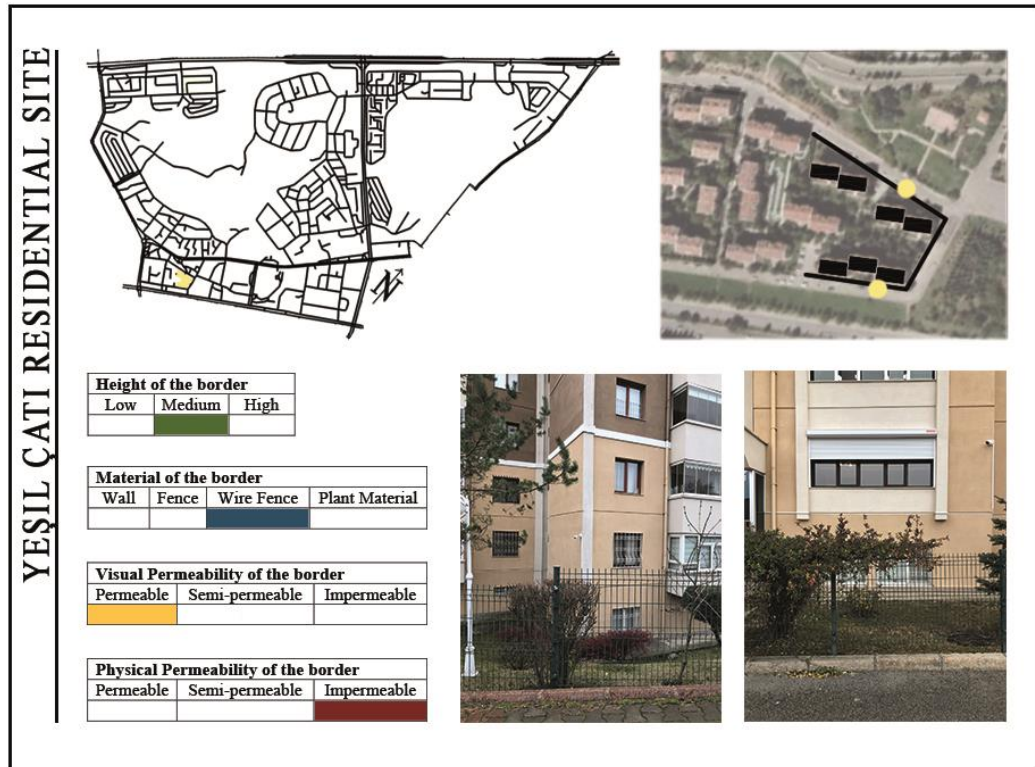


Figure 5.35 Boundaries of Yeşil Çatı Residential Site

5.1.27 Akşar Residential Site

Akşar Residential Site (Figure 5.36) has medium height, wall, wire fence, and plant borders. They are visually semi-permeable. The site is physically impermeable.



Figure 5.36 Boundaries of Akşar Residential Site

5.1.28 Yeşil Ada Residential Site

Yeşil Ada Residential Site (Figure 5.37) has medium and high borders. They are made of wall and wire fence. On the other part of the site, the borders are wire fence and plant. The borders are visually semi-permeable and impermeable. The site is physically impermeable.



Figure 5.37 Boundaries of Yeşil Ada Residential Site

5.1.29 Çelikkent A Residential Site

Çelikkent A Residential Site (Figure 5.38) has a different height and material borders on different sides. Next to the main road, the borders are high, wire fence and plant material, and visually impermeable. The part next to Çelikkent B has medium height, wire fence, visually permeable borders. The other part is medium height, wall, fence, plant, and visually semi-permeable borders. The site is physically impermeable.

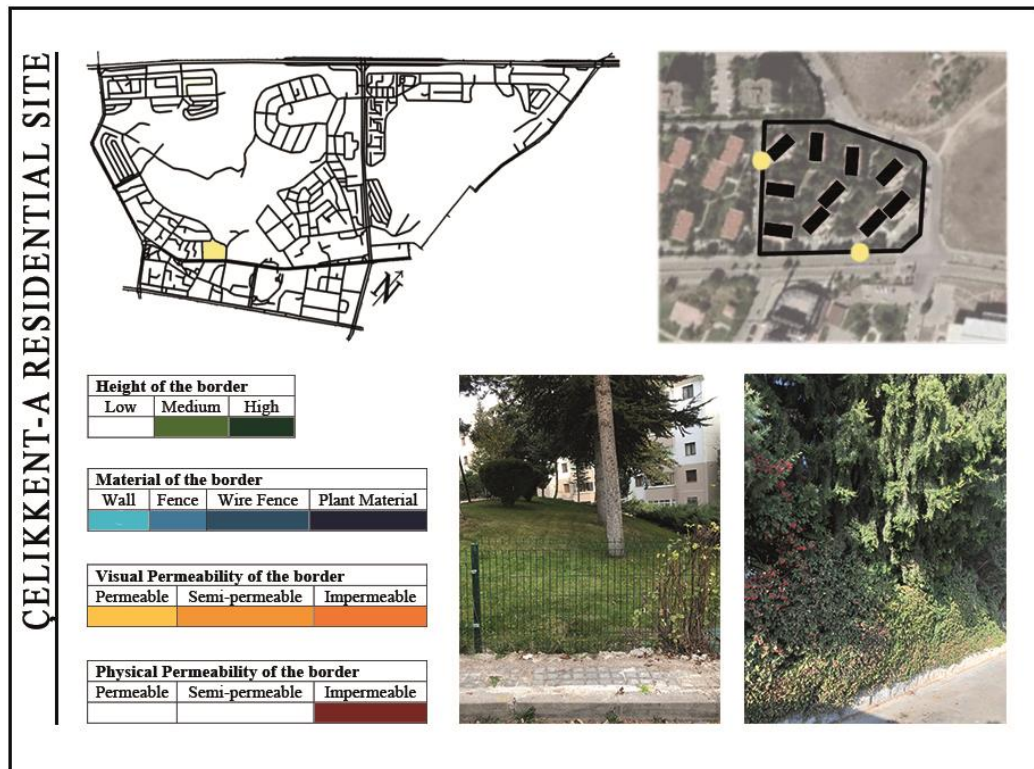


Figure 5.38 Boundaries of Çelikkent-A Residential Site

5.1.30 Çelikkent B Residential Site

Çelikkent B Residential Site (Figure 5.39) has medium height, fence, wire fence, and plant borders. They have both permeable, semipermeable, and impermeable parts visually. The site is physically impermeable.

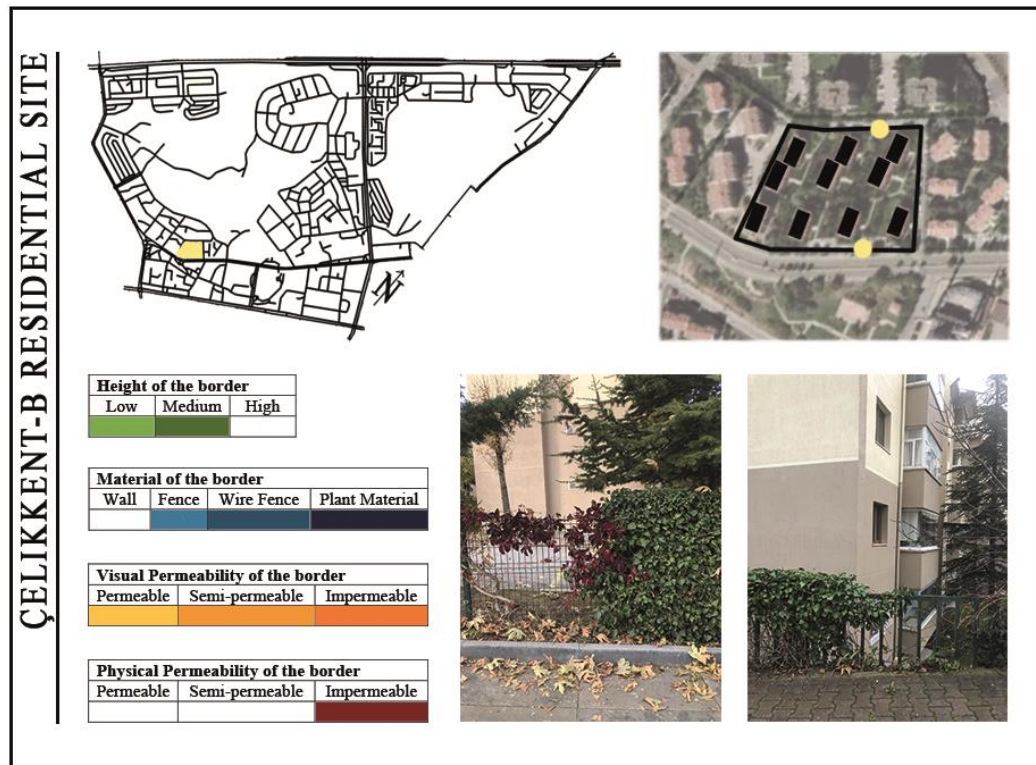


Figure 5.39 Boundaries of Çelikkent-B Residential Site

5.1.31 Bulut Residential Site

Bulut Residential Site's (Figure 5.40) borders are shaped by the topography. It has low height retaining walls next to the main street. On the backside, it has medium and wall and wire fence borders. The borders are visually permeable and semi permeable. The site is physically semi-permeable.

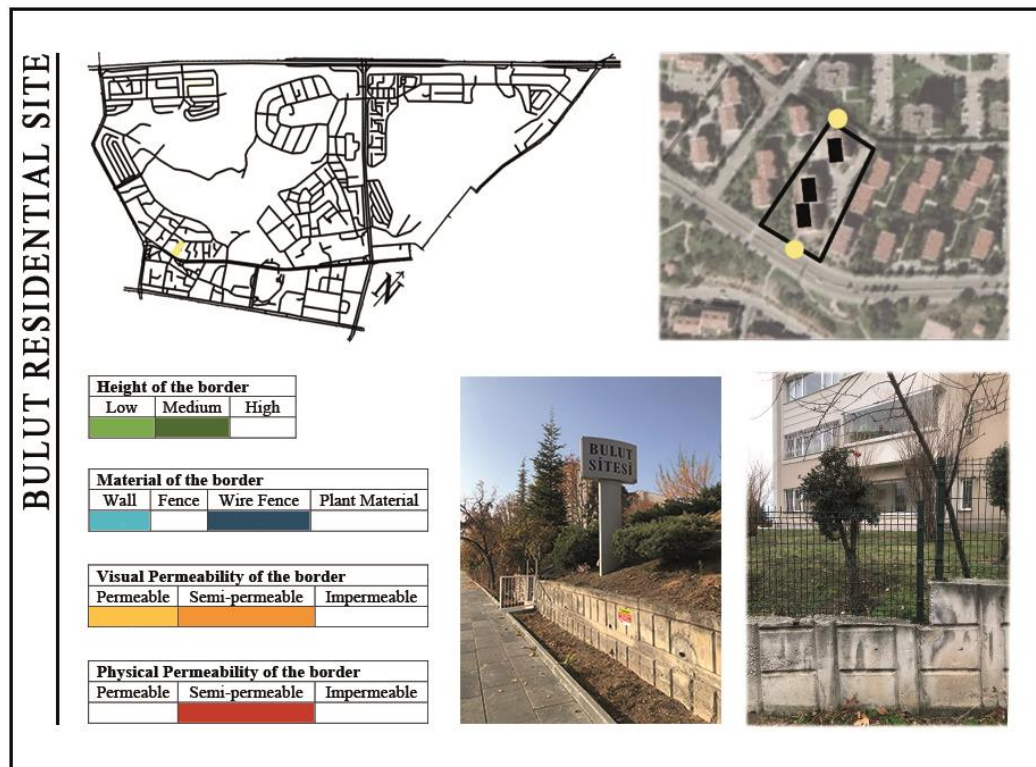


Figure 5.40 Boundaries of Bulut Residential Site

5.1.32 Toptancı Hal Residential Site

Toptancı Hal Residential Site (Figure 5.41) has medium and high borders. They are made of wall, wire fence, and plant material. They are visually impermeable. The site is physically semi-permeable because of an inner street in the site that provides transition to Bulut Residential Site.



Figure 5.41 Boundaries of Toptancı Hal Residential Site

5.1.33 Oyak 10 Residential Site

Oyak 10 Residential Site (Figure 5.42) has medium and high borders. The borders made of wall, wired fence, barbed wire fence, and plant material. There are parts visually permeable, semi-permeable, and impermeable. They are physically impermeable.



Figure 5.42 Boundaries of Oyak-10 Residential Site

5.1.34 Güzelçatı Residential Site

Güzelçatı Residential Site (Figure 5.43) has medium height, wall, fence, and in some parts, plant material borders. They are visually semi-permeable, and the site is physically impermeable.

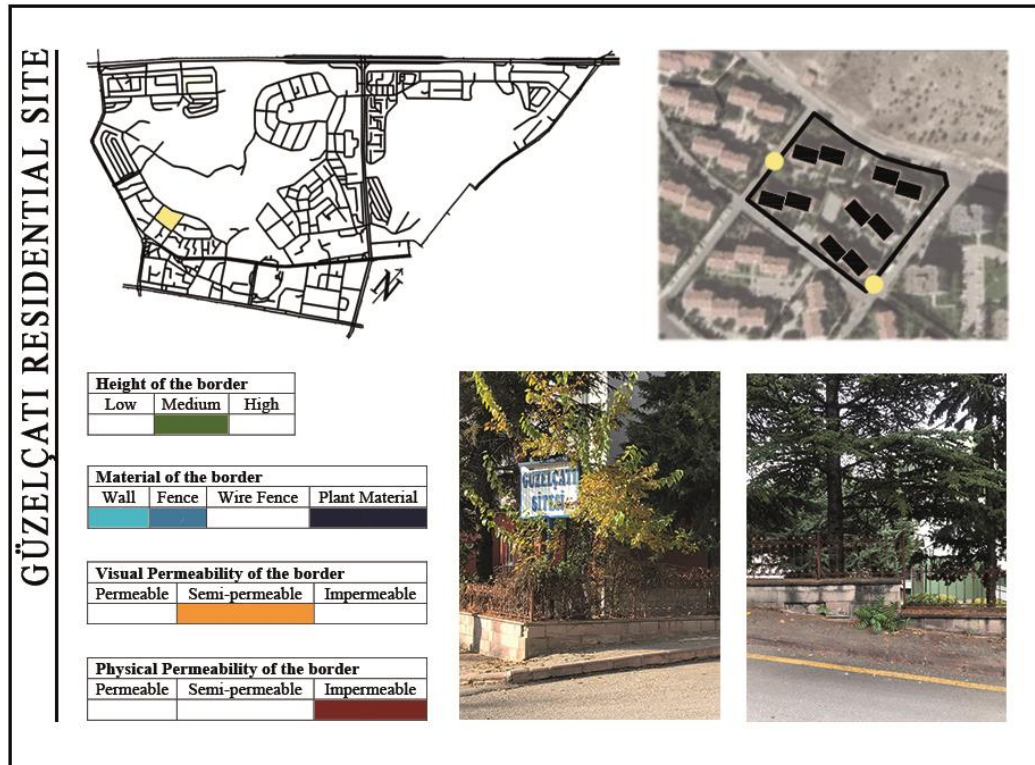


Figure 5.43 Boundaries of Güzelçatı Residential Site

5.1.35 Akçam Residential Site

Akçam Residential Site (Figure 5.44) has medium height, wall, fence, and plant borders. They are visually semi-permeable and impermeable, and the site is physically impermeable.

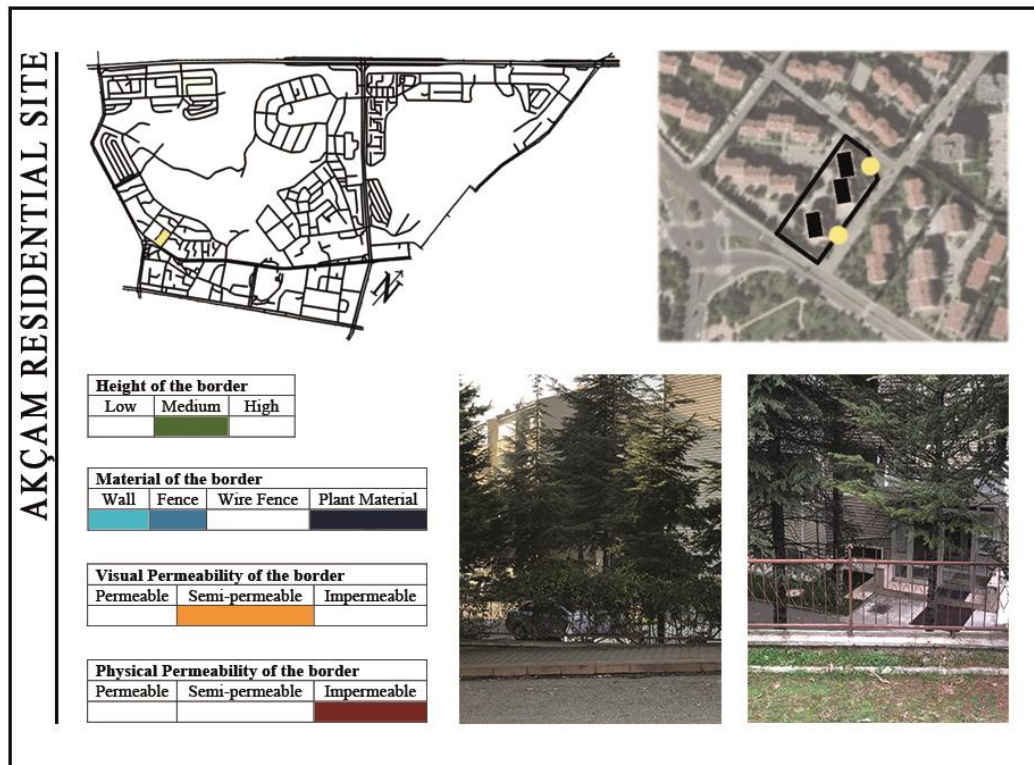


Figure 5.44 Boundaries of Akçam Residential Site

5.1.36 Başkent Doktorlar Çokkathlı Residential Site

Başkent Doktorlar Çokkathlı Residential Site (Figure 5.45) has high, wall, fence, and plant borders. They are visually impermeable, and the site is physically impermeable.



Figure 5.45 Boundaries of Başkent Doktorlar Çokkathlı Residential Site

5.1.37 Güzeltan Residential Site

Güzeltan Residential Site (Figure 5.46) has high, wall, wire fence, and plant borders. They are visually impermeable, and the site is physically impermeable.

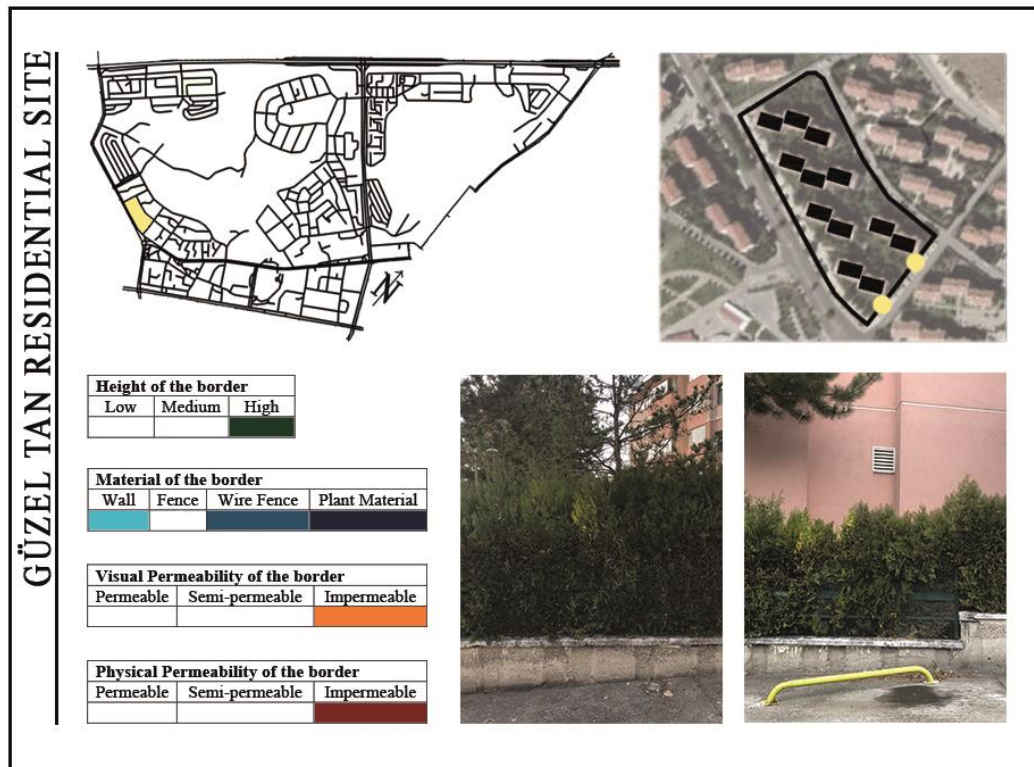


Figure 5.46 Boundaries of Güzel Tan Residential Site

5.1.38 Rüyam Residential Site

Rüyam Residential Site (Figure 5.47) has medium height, wall, fence, and plant borders. They are visually semi-permeable and, in some areas, impermeable. The site is physically impermeable.

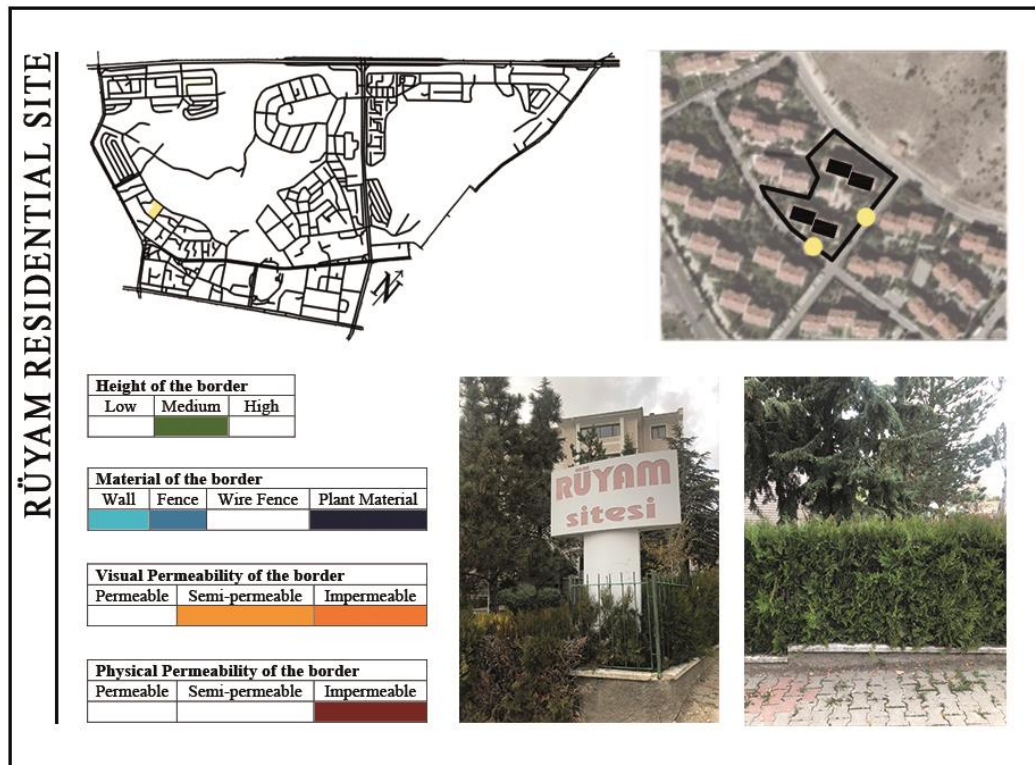


Figure 5.47 Boundaries of Rüyam Residential Site

5.1.39 An-90 Residential Site

An-90 Residential Site (Figure 5.48) is in between Rüya and Ladin Residential Sites. They are sharing inner borders. In the outer part, An-90 Residential Site has medium height, wall, fence, and plant borders. The borders are visually semi-permeable, and the site is physically impermeable.

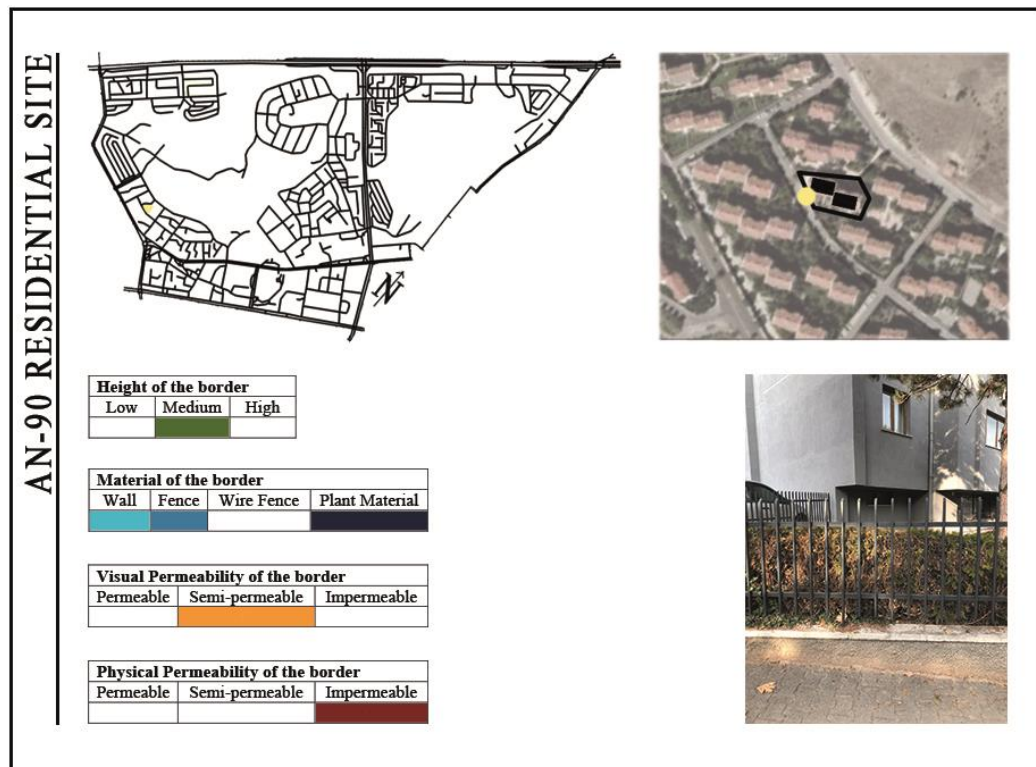


Figure 5.48 Boundaries of An-90 Residential Site

5.1.40 Ladin Residential Site

Ladin Residential Site (Figure 5.49) has medium height, wall, and fence borders. In some parts, there are also plant borders. Except for those tiny parts, the borders are visually fully permeable, and the site is physically impermeable.

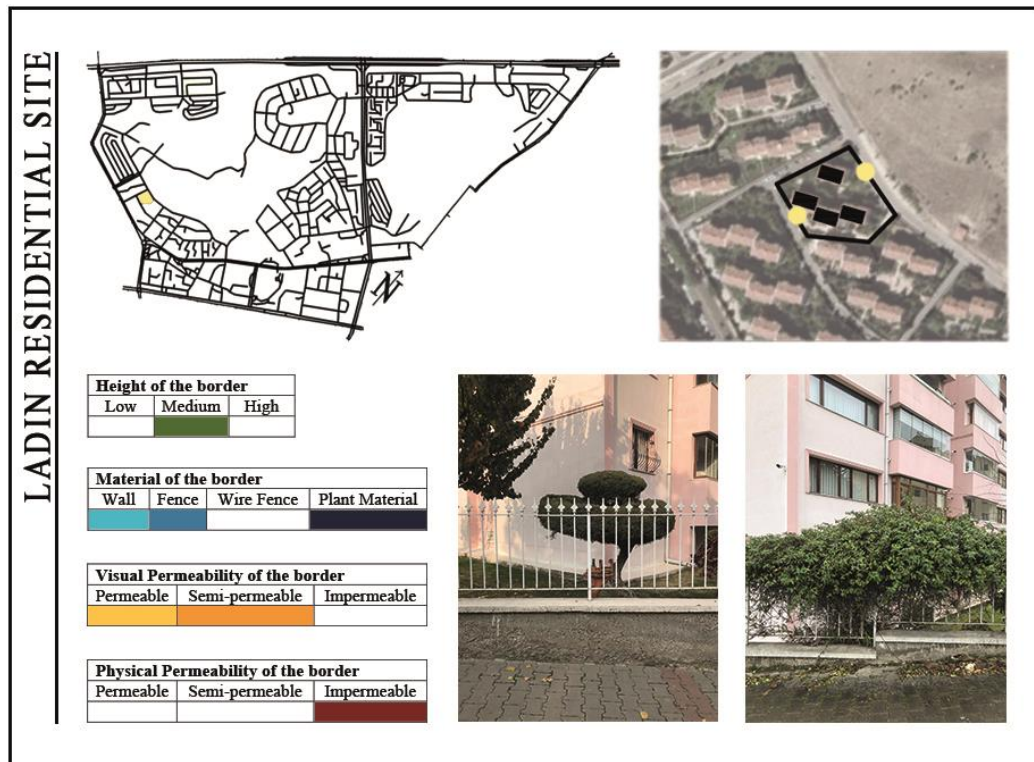


Figure 5.49 Boundaries of Ladin Residential Site

5.1.41 Temsa Residential Site

Temsa Residential Site (Figure 5.50) has medium height, wire fence borders. Next to the inner side of the fences, there are low height plant borders. The borders are visually permeable. However, the other side of the site has also plant material borders, and this part is visually semi-permeable. The site is physically impermeable.

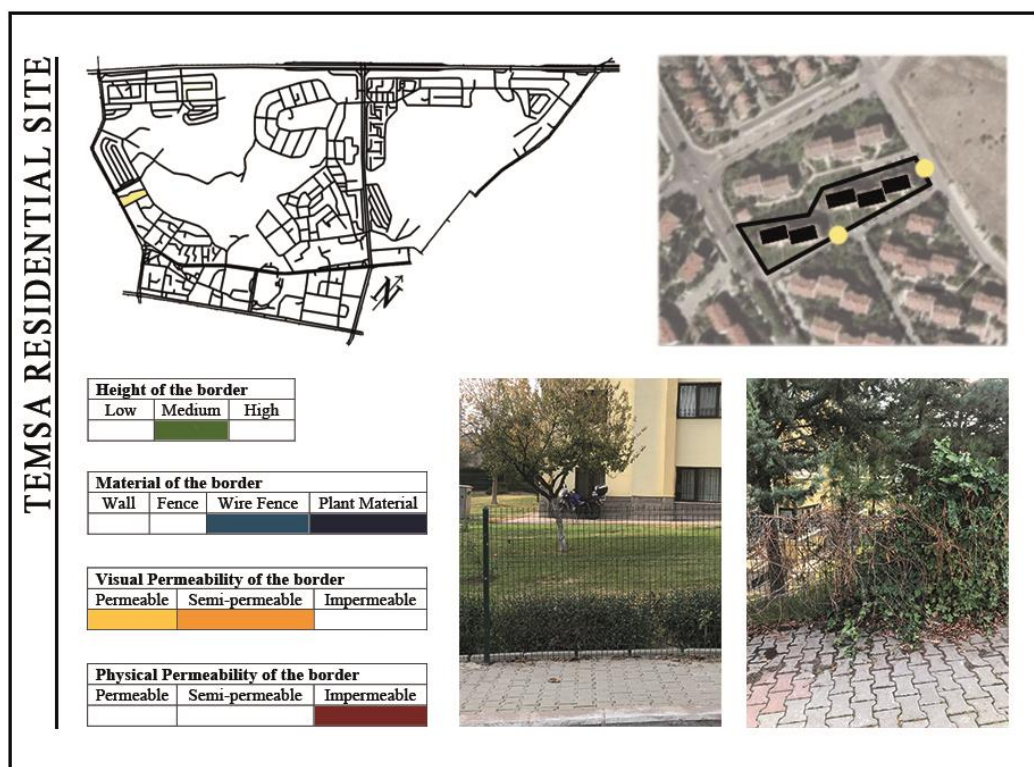


Figure 5.50 Boundaries of Temsa Residential Site

5.1.42 Çayyolu Çamlık Residential Site

Temsa and Çayyolu Çamlık Residential Sites are located in one parcel but they have a path between them. Çayyolu Çamlık Residential Site (Figure 5.51) has medium height, wire fence, and plant borders. They are visually semi-permeable and impermeable. The site is physically semi-permeable because of a wide road leading into the residential site and allowing a transition for pedestrians.



Figure 5.51 Boundaries of Çayyolu Çamlık Residential Site

5.1.43 Yeşiltepe Houses

Yeşiltepe Houses (Figure 5.52) is a single-family house site, and it has mostly very high, and wall, fence, wired fence, and plant borders. There are visually semi-permeable and impermeable areas. The topography and personal preferences shaped borders. The site is physically impermeable.

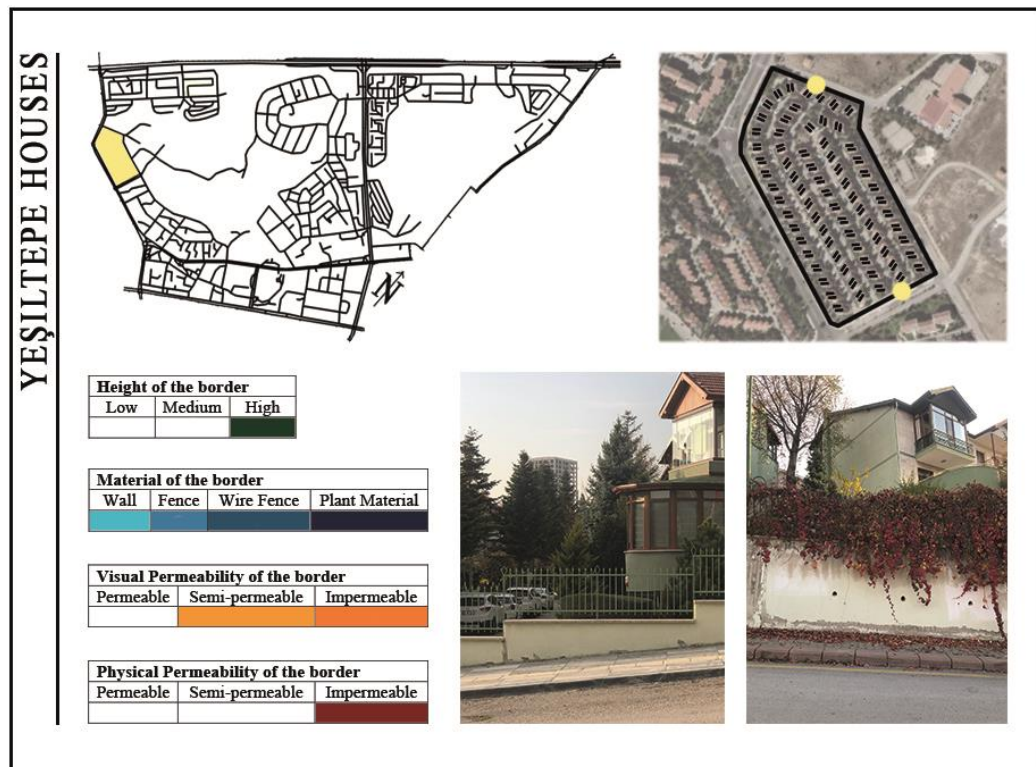


Figure 5.52 Boundaries of Yeşiltepe Residential Site

5.1.44 Seçkin Emek Residential Site

Seçkin Emek Residential Site (Figure 5.53) has high, wall, fence, wire fence, and plant material borders. They are visually semi-permeable and impermeable parts. The site is physically permeable.

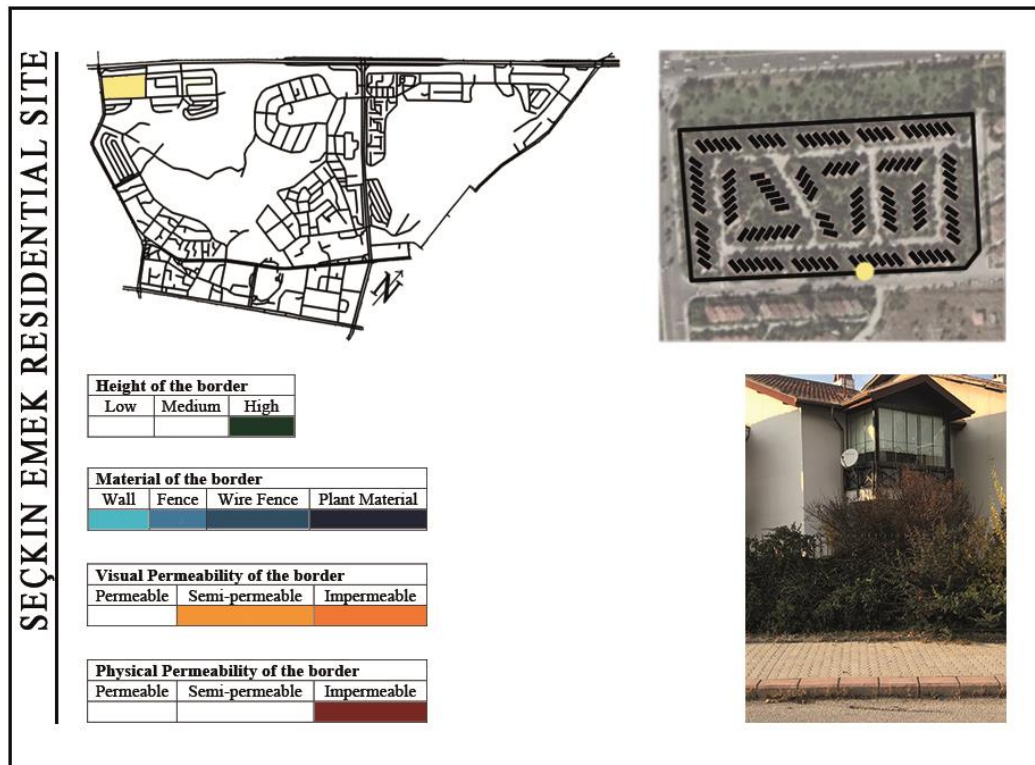


Figure 5.53 Boundaries of Seçkin Emek Residential Site

5.1.45 İdareciler Residential Site

İdareciler Residential Site (Figure 5.54) has low and medium height, wall and fence and in some parts plant borders. They are parts which are visually permeable, semi-permeable and impermeable. The site is physically semi permeable because the road between buildings is not controlled.



Figure 5.54 Boundaries of İdareciler Residential Site

5.1.46 Attached and Detached Single-Family Houses in Koru Neighborhood

The attached, detached and row single-family houses (Figure 5.55) in Koru Mesa Residential Site, Azat Bey Residential Site, the inner part of Tuğberk Residential Site, Seçkinler Residential Site, Yeşilkent Residential Site, Uyum Residential Site, Atakent Residential Site, Mavi Kent Residential Site, Akşar Houses have their garden borders depend on their personal preferences. These single-family houses have a direct connection to public streets, unlike the residential sites which have one another border that surrounds all single-family houses in the site. There are examples of all kinds of variations of height, material, and visual and physical permeability parameters for these houses. While there are houses that don't have any borders, there are also houses with very high, visually, and physically impermeable borders.

Azat Bey Residential Site is mostly used for commercial or educational purpose, and all buildings on the site have their own unique borders. They are mostly high and in some parts there is material and color consistency. Attached, detached and row single-family houses in Koru Mesa Residential Site also have their own borders as their user's preferences. Some row houses have adjacent borders. Seçkinler, Yeşilkent, Uyum, Atakent Residential Sites and Akşar Houses allows strangers and vehicles to use inner roads of them, so they are physically semipermeable. Mavi Kent Residential Site have their own borders, but the inner streets of the residential site are controlled. Single-family houses in Yeşilkent and Uyum Residential Site have their own borders, but they use the same fence material to create unity.

Some of the single-family houses don't have any boundary elements in their front garden, but they have high and impermeable borders in the backside. This reminds the borders that don't have much effect on safety. In some single-family house

gardens, only the borders near to dining area have visual impermeability. This is also because of privacy needs. Some of the houses don't have any boundary elements, but they have warning signs that state the existence of security cameras.

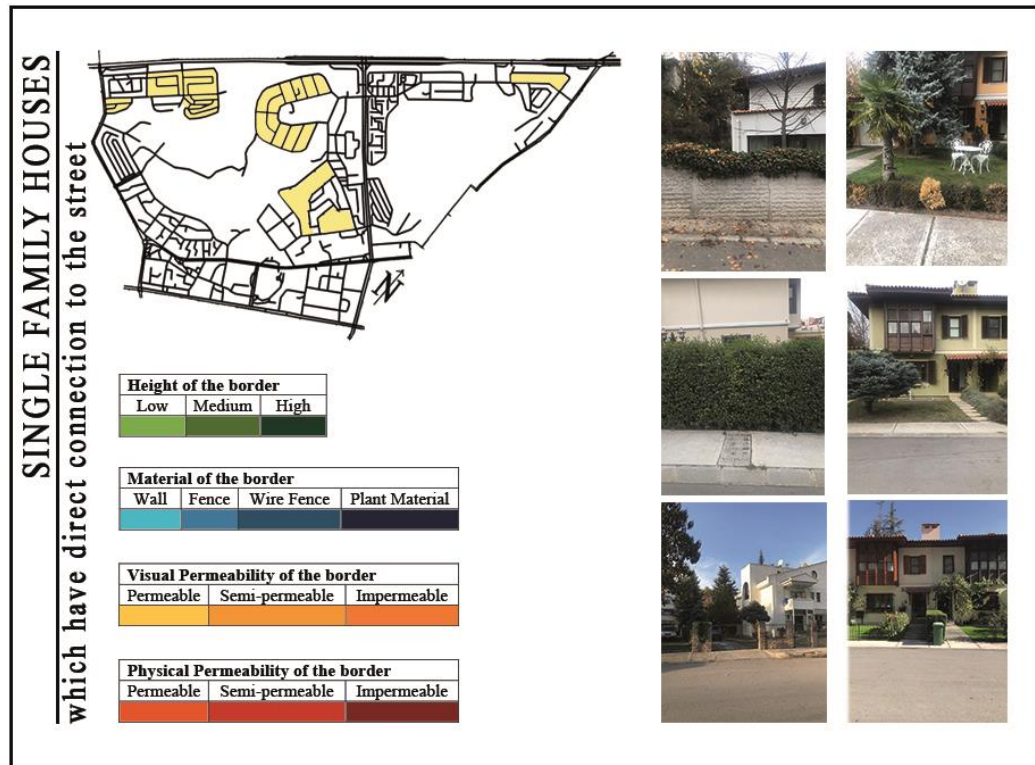


Figure 5.55 Boundaries of Single-Family Houses in Koru Neighborhood

5.2 Analyses of Boundaries of Residential Sites in Koru Neighborhood

Residential areas and their borders dominate the suburban areas like Koru Neighborhood. Figure 5.56 shows the domination of boundaries of residential sites in Koru Neighborhood. The filled ones are the single-family house sites, so they mostly have inner borders, too. All these boundaries have different kinds of heights, materials, and permeability levels.

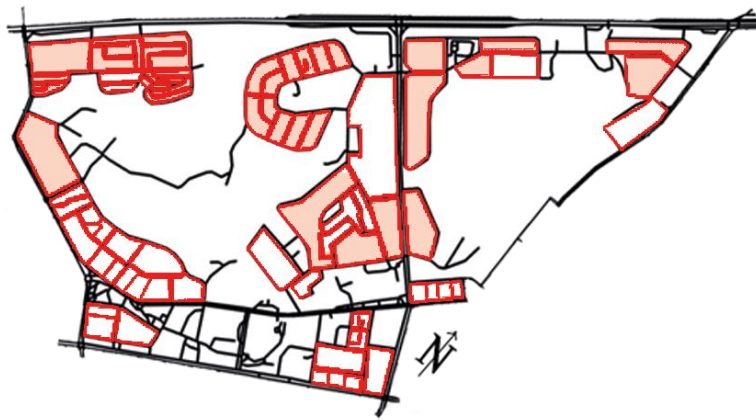


Figure 5.56 Boundaries of Residential Sites in Koru Neighborhood

45 apartments and single-house residential sites which have an outer boundary are evaluated in Table 5.1 with color codes. Color codes are used to facilitate and understand border type patterns in the neighborhood and the residential sites, which are next to each other or near each other are following each other in Table 5.1. This facilitates observation of residential site borders collectively in urban areas. Residential sites and single-family houses which have a direct connection to public streets are not evaluated because of their diversity and this depends on user's preferences in every single house.

Table 5.1 Boundaries of Residential Sites of Koru Neighborhood

	Height of the border			Material of the border				Permeability of border					
	Low	Medium	High	Wall	Fence	Wire Fence	Plant Material	Permeable	Semi-permeable	Impermeable	Permeable	Semi-permeable	Impermeable
Gordion Houses													
Ari Residential Site													
Şahin Residential Site													
Birlikkent Residential Site													
Beyazgül Residential Site													
Beyazgül A-1 Residential Site													
Beyazgül A-2 Residential Site													
Doğa Residential Site													
Köknar Apartment													
Canyuva Apartment													
Özgecan Apartment													
Güzelkent Residential Site													
Koru Residential Site – apartments													
Tuğberk Residential Site													
Ema Asmabahçe Residential Site													

Table 5.1 Boundaries of Residential Sites of Koru Neighborhood (continued)

	Height of the border			Material of the border				Permeability of border					
	Low	Medium	High	Wall	Fence	Wire Fence	Plant Material	Permeable	Semi-permeable	Impermeable	Permeable	Semi-permeable	Impermeable
Arı Blocks													
Simten Residential Site													
Mıtaş Residential Site													
Otuzevler Residential Site													
Oyak 7 Residential Site													
Vadikent Residential Site													
Özden Apartment													
Kilim Apartment													
Değişim Apartment													
Funda Residential Site													
Yeşil Çatı Residential Site													
Akşar Residential Site													
Yeşil Ada Residential Site													
Çelikkent A Residential Site													
Çelikkent B Residential Site													

Table 5.1 Boundaries of Residential Sites of Koru Neighborhood (continued)

	Height of the border				Material of the border				Permeability of border					
	Low	Medium	High	Wall	Fence	Wire Fence	Plant Material	Permeable	Visual		Physical		Impermeable	
									Semi-permeable	Impermeable	Permeable	Semi-permeable		
Bulut Residential Site														
Toptancı Hal Residential Site														
Oyak 10 Residential Site														
Güzelçatı Residential Site														
Akçam Residential Site														
Başkent Doktorlar Çokkatlı Residential Site														
Güzeltan Residential Site														
Rüyam Residential Site														
An 90 Residential Site														
Ladin Residential Site														
Temsa Residential Site														
Çayyolu Çamlık Residential Site														
Yeşiltepe Houses														
Seçkin Emek Residential Site														
İdareciler Residential Site														

Table 5.1 shows residential sites that are next to or close to each other tend to have similar heights, materials, and permeability levels. For instance, Rüyam, An90, Ladin, Temsa, Çayyolu Çamlık Residential Sites has medium height borders. Oyak7, Vadikent Residential Sites, Kilim, and Değişim Apartments have wall, wired fence, and plant material borders. Vadikent Residential Site, Özden and Kilim Apartments have visually semi-permeable and impermeable borders. According to Table 5.1, visually impermeability is followed by adjacent and adjoining residential site's boundaries. Most of the residential sites are physically impermeable in Koru Neighborhood; however physically semi-permeable ones, such as Bulut and Toptancı Hal Residential Sites, are adjacent.

5.2.1 Height of Residential Site Borders in Koru Neighborhood

Most of the residential sites in Koru Neighborhood have a different level of heights on their borders. According to Table 5.1, there are 62 different height levels (low, medium, high) in 45 residential sites. 8 of them are low, 35 of them are medium, and 19 of them are high borders. Just 2 of low bordered residential sites are continuous in height, and these are Mutaş and Otuzevler Residential Sites, which are adjacent and can be count as one residential site. Other low bordered residential sites also have another height because of the topography change or other unknown reasons. There are medium height borders the most, and 18 of 35 them are just medium height. 7 of 19 high borders are just high, so it can be said that rather than topography effect, they are intentionally high. To sum up, the residential site borders are mostly medium height, later high and the least low in Koru Neighborhood.

Most of the residential sites have various levels of heights on their borders. The main reason for this change is topography. Only Arı Blocks have 3 different height levels on their borders; other sites have low/medium or medium/high borders. The

most dramatic change is on Beyazgül Residential Site's borders, which are sometimes almost 5-6 meters, and in some parts, they are medium height. When a residential site is built in a higher or lower land, it requires retaining walls, and generally, these become the borders of the site. The borders which are higher than 2 meters are because of the topographic reasons in Koru Neighborhood.

5.2.2 Material of Residential Site Borders in Koru Neighborhood

The borders of residential sites in Koru Neighborhood are also a combination of different materials. Yeşil Çatı Residential Site has just wire fence borders, and Köknar Apartment has just plant borders. The other 43 residential site's borders are a combination of wall + fence (2), wall + wire fence (1), wall + plant material (1), wall + fence + plant (10), wall + wire fence + plant material (14), fence + wire fence + plant material (1), wire fence + plant material (7) or wall + fence + wire fence + plant material (7). There are 127 different material use (wall, fence, wire fence, and plant) in 45 residential sites, and 35 of them are wall, 19 of them are fence, 31 of them are wire fence, and 42 of them are plant material. These materials are mostly not on one layer, but they are in different parts of borders. Almost all residential sites have a little or fully plant material on their borders. Wire fence's domination to the fence can be because of its more economical cost and ease of set up.

In lots of residential site borders, there is no consistency in materials. There are different materials at different edges of the borders. This material change usually takes place in the residential sites which are next to the main street. The use of thick plant materials increases in these parts like Çelikkent-A Residential Site.

Sometimes without an apparent reason, the border material can change in a continuing line of a residential site, sometimes even the wall material and texture

can change in different parts of large residential sites. Vadikent Residential Site's borders are made of just plants in some parts, and in some parts, they are made of wall, wire fence, and plant material. Wire fence and wall types change in different parts of the borders.

If the residential sites or single-family houses prefer using plant material in their borders, whether they are visually permeable or not, they make strangers see some green. It has a positive effect on psychology. However, at the same time, plant material needs maintenance, and especially if it is deciduous, it can seem neglected in the wintertime.

5.2.3 Visual Permeability of Residential Site Borders in Koru Neighborhood

Residential Site Borders of Koru Neighborhood have different levels of visual permeabilities on their borders, so 20 of 45 residential site borders have visually permeable parts, 32 of 45 have semi-permeable parts, and 31 of 45 have impermeable parts. 3 residential sites which are Müttaş, Otuzevler and Yeşil Çatı have only visually permeable borders. 4 residential sites have visually semi-permeable borders, and 7 residential sites have visually impermeable borders. Continuity of visual permeability shows conscious preference.

31 Residential sites have different levels of visual permeability in their borders. 9 of them have both permeable, semi-permeable, and impermeable parts. When residential site boundaries which have the same visual permeability level alongside the boundary and the ones which have different level of visual permeabilities are counted together, there are 20 visually permeable, 33 semi-permeable and 31 impermeable borders.

Dramatic changes in borders about visual permeability occur when a residential site is next to the main street. The borders next to the main streets are generally higher and thicker. The reason for that can be keeping away strangers or blocking noise and air pollution.

In single-family houses, the visual permeability level is a personal choice. While some of the houses have 100% visual permeability, some of them have 100% impermeable borders. The different levels of visual permeability on borders are also seen in single-family houses. It is observed that some visually permeable borders have some impermeable parts which are near to the dining space. Low visual permeability is mostly related to privacy needs. The need for personal privacy changes from an individual to the other according to many different variables.

Height and material preferences on borders are not always affecting the visual permeability level, according to Table 3.1. If a residential site's borders are high, without topographic reasons, they tend to be visually impermeable such as Ema Asmabahçe and Başkent Doktorlar and Güzeltan Residential Site. However, if the heights are shaped with topography, visual permeability varies. Examples for that are Arı Blocks and Beyazgül Residential Site.

All visually impermeable sites also have plant borders. While it is expected to have wall border blocks visual access, it is not always accurate because walls are generally used short and combined with other materials.

Impermeable visual borders limit the passive access of urban green areas, which are decreased in urban areas. Especially if the borders do not have any voids and if they are not plant material, this is a loose of opportunity to increase public health by visual access to these open green spaces.

5.2.4 Physical Permeability of Residential Site Borders in Koru Neighborhood

40 of the 45 bordered residential sites have physically impermeable borders in Koru neighborhood, and they do not let pedestrians or vehicles inside for transition or recreation. 5.57 shows physical permeability densities of residential sites:



Figure 5.57 Physical permeability densities of residential sites in Koru Neighborhood

Apartment sites in Koru Residential Site are only physically permeable sites in Koru Neighborhood. In this site, some apartments have low or medium borders that are not controlled or continuous. Thus, the site can be count as also semi-permeable. A full road as public streets cut Toptancı Hal Residential Site for Bulut and Çelikkent-B Residential Sites resident's access. These sites are adjacent, and access to sites are provided with this common road, so Toptancı Hal and Bulut Residential Sites are physically semi-permeable.

There is a street between Temsa and Çayyolu Çamlık Residential Sites. Temsa Residential Site is fully enclosed and physically impermeable, but Çayyolu Çamlık Residential Site allows partly for pedestrians' transition, so this site is counted as physically semi-permeable. Also, İdareciler Residential Site is physically semi-permeable with it is an open and full inner street.

The other 40 residential sites are physically impermeable. Some of them are strictly controlled such as Gordion Houses, Birlikkent, Ema Asmabahçe, and Seçkin Emek Residential Sites, some of them are freer such as Beyazgül, Vadikent or Rüyam Residential Sites.

According to Cresswell (2010) and Graham and Wood (2003), today distinction, segregation, delamination, and defense of personal space happen not only using physical barriers and new technologies, and practices like CCTV, security guards, vigilante groups, and other forms of monitoring can control the areas. And these devices are changing from physical barriers towards less apparent forms of surveillance (Habeck and Belolyubskaya, 2016, p. 127). In addition to physical borders, these technologies and security guards are also seen in Koru Neighborhood.

The physical borders, cameras, and warning sites that say "only residents" or "do not use for transition" in front of or around these sites keep strangers away.

Although the impermeability level might change, all these residential sites are regarded as impermeable because they are not welcoming strangers.

Moreover, there are residential sites that share the same parcel and the same borders, so while they do not let strangers in the residential site, they also block transition outside of the borders, too. These are the residential sites which have adjacent boundaries inside the parcel and blocking transition between residential sites:

- Köknar, Canyuva, Özgecan, and Güzelkent Apartments (Figure 5.58)
- Arı Blocks, Simten Residential Site
- Müttaş and Otuzevler Residential Site
- Değişim, Kilim, and Özden Apartments (Figure 5.58)
- Funda and Yeşil Çatı Residential Sites
- Akşar and Yeşil Ada Residential Site
- Çelikkent-B, Bulut and Toptancı Hal Residential Sites (Figure 5.58)
- Başkent Doktorlar Çokkatlı and Akçam Residential Sites (Figure 5.58)
- Rüyam, An-90 and Ladin Residential Sites
- Temsa and Çayyolu Çamlık Residential Sites



Adjacent borders of Güzelkent and Özgecan Apartments



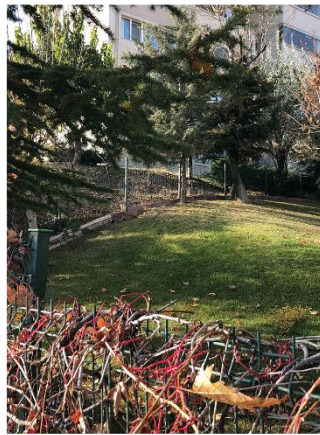
The adjacent borders of Değişim Apartment and Kilim Apartments



The border in-between Değişim Apartment and Kilim Apartments



The adjacent borders of Kilim Apartment and Özden Apartment



The border in-between Çelikkent-A and Bulut Residential Sites



The adjacent borders and in-between border of Başkent Doktorlar Çokkatlı Residential Site and Akçam Residential Site

Figure 5.58 Adjacent borders

These adjacent borders are not just used for restricting physical transition, but they also decrease the level of identification of the areas. The identification role and function of borders disappear, and it becomes difficult for a stranger to understand where the private areas of boundaries start and end.

Restriction of physical permeability increases spatial and social segregation. It extends the pedestrian routes, which causes reduced walkability and ease of

movement in the urban areas. Therefore, physical permeability level affects urban quality. Figure 5.59 shows Koru Residential Site's permeable physical borders. When someone wants to reach from point A to point B, he/she can use the green route (See Figure 5.60). If the site were impermeable, pedestrians would have to walk from the street next to apartments (yellow route), and that would cause both loss of time and a loss of opportunity to experience green area.



Figure 5.59 Physically permeable parts of Koru Residential Site

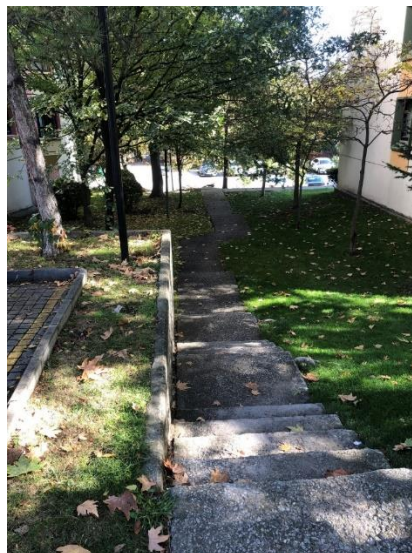


Figure 5.60 Routes that provide physical permeability in Koru Residential Site

Figure 5.61 shows if the impermeable physical boundaries of Oyak-7 Residential Site is permeable and the routes (Figure 5.62) that are useable for strangers.

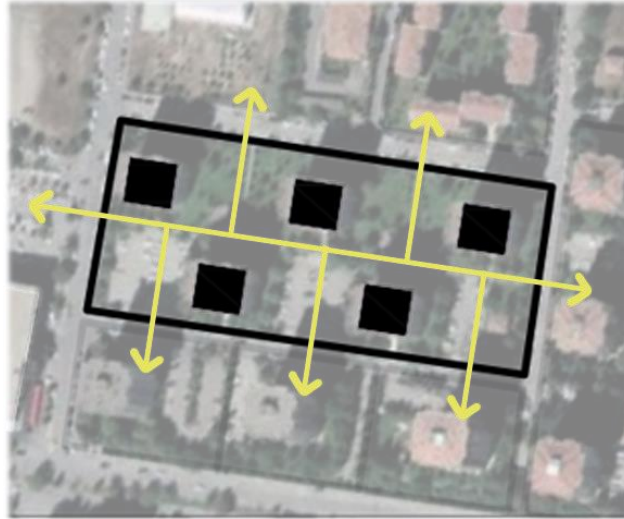


Figure 5.61 The useable routes if the Oyak 7 Residential Site's borders are physically permeable



Figure 5.62 Inner streets of Oyak 7 Residential Site

Moreover, the physical impermeability of residential sites does not allow people to experience green areas in these sites. These green areas are only open to a few people who are residential site users. With urbanization, green areas in urban settlements are decreased, and people do not have access to open green areas. These private residential site gardens can increase the active useable green areas if the physical permeability level decreases. Since open green spaces are interaction areas with “others,” this application can revive the public spaces and human interaction.

Figure 5.63 shows the examples of the regular and green route of a resident of Otuzevler Residential Site who walks from Arcadium Shopping Mall to his home. The yellow route is his/her regular route, which does not have so much green, and the green route is the one which goes through Oyak 7 Residential Site and allows to interact with more green areas.



Figure 5.63 Experiencing green areas in residential sites by strangers

5.3 Do Physical Residential Site Boundaries Fulfill Their Functions?

The first reason for the emergence of physical boundaries is the need for safety, but is it still a reason for building borders in residential sites? Especially in the years between 2009 and 2014, robbery was common in Koru Neighborhood according to mukhtar Türkan Yezer. These cases mostly happened in the unprotected single-family houses and apartments which don't have physical borders, security guards, and cameras. After these common cases, single-family dwellings and apartments started to find security solutions. They installed camera systems, hire security guards, built borders, etc. In the last 4-5 years, these robbery cases decreased, and today there are rare. These show that safety and security problems are the prominent reasons for high safety and security preventions. However, at the same time, the preventions increased in 2014 when Koru metro station opened. Since then, the accessibility of this middle-class neighborhood has risen significantly due to its high connectivity. The population and traffic have concomitantly increased after Koru Metro, according to the interviews conducted with Koru residents and the Mukhtar. This reason may also lead people to feel more need for protection in their territory. However, it can be said that physical residential site boundaries create a sense of safety and security at some level because it is one of the most important reasons for building them.

The function of defining, determining, and giving the identity of physical boundaries are fulfilled in a few residential sites. Still, most of them are not sufficient to determine the site and provide an identity to it.

Continuity in height and material help for fulfilling these functions. However, because of the irregular topography of the Koru Neighborhood, there are so many borders in sites that have dramatic changes in their heights. Ari Blocks has material continuity on its borders, but heights vary from very low to high. The material continuity helps in defining the space and giving identity; however, the site is

adjacent to the Simten Residential Site, and there is no sign for that, so this creates confusion. Beyazgül A-2 has continuity on height and material on its borders, so they can define the site and give an identity. However, the reason for changing height and material in borders are not always topography. Sometimes without a visible cause, changes occur. This can be because of negligence, and also, these borders don't fulfill the determination function of borders.

-
If there is no visual permeability even if the site's borders are continuous on height and material, they are not giving a firm definition and identity to the residential site. An example of that is Güzel Tan Residential Site, which has continuous high, wall, wire fence, and plant material borders. The site and apartments cannot seem from the borders and because of that, it is not recognizable to know you are next to the same site, and the borders could not give identity.

The residential site, which is in the same parcel and has adjacent borders with the residential site next to them, has borders which do not identify the site clearly. Because it is miscible where the border starts and ends if it is not very different than the border next to it. Small differences on high, material, or texture are not enough to determine the site easily.

Ladin Residential Site has recognizable borders and gives identity to the site; however, the site is adjacent with An-90 and Rüyam Residential Sites, so while the borders giving identity, they are not defining the site very clearly.

The privacy function of physical borders is mostly about visual permeability. Residential site borders create the desired level of privacy, especially on a few storied single-family houses. These houses' borders shaped mostly with personal preferences so that users can decide their privacy level. Single-family house borders tend to be visually more impermeable; however, some borders create 100% permeability. There are house gardens in Koru Sitesi area which have high and

impermeable boundaries in the back yard and no borders in the front garden. This is an evidence of different privacy needs in different parts of the garden and the ability of borders for meeting this need.

There are examples of single-family house sites borders which have permeable parts such as Tuğberk Residential Site, and impermeable parts such as Seçkin Emek Residential Site. Every single-family house can construct its own border in these bordered single-family house sites.

The residential sites with apartments also have visually permeable, semi-permeable, and combined borders, and they meet their need for privacy level.

Every physical boundary creates dualism, and if a border is perceivable, it creates inside and outside, and this is applicable also for residential site borders in Koru. This dualism strengthens segregation, and even if the dualism feature is fulfilled with residential borders, it is an effect on urban areas. They are debatable.

Residential site borders are a result of psychosocial territory behavior and defending the site, and they fulfill these by their existence. As it is reviewed in Chapter 2.1.3.4, psychosocial territory behavior is related to customization. Just a few residential borders are unique or customized. The fences of Uyum Residential Site are an example of customized borders.

All residential site borders show ownership with their existence. This feature is more powerful in single-family houses and less obvious in adjacent bordered residential sites. In these adjacent sites, the territory is not well-defined, and this reduces the emphasis of ownership.

With their existence, residential site boundaries determine hierarchy by dividing space. The difference in the hierarchy is not so high in low and impermeable boundaries such as apartments in Koru Residential Site. However, the rigid boundaries like Ema Asmabahçe Residential Site determine stronger hierarchies

between residents and strangers. The dividing activity is not only physical, while they divide the area physically; this also has a social effect.

The bordered residential sites of single-family houses also have inner borders for each house. These are also examples of the hierarchy determination function of borders.

When a single-family house garden or apartment residential site border starts, it is an indicator of the site is detached, and it has its own management system by its residents. As all residential sites have their own management system or steering committee, residential borders provide order and show that there is a different management system in that site. Therefore, all these residential borders contribute to providing order. The borders' features show the rigidity of the laws. A very low and physically permeable border can demonstrate orders which are not very different from the public space rules like apartment sites Koru Residential Site. However, high, visually, and physically impermeable borders can demonstrate a totally different order system than the public sphere in the site. Gordion Houses is an example of this kind of boundaries.

Residential site borders can be used as a connection and interaction provider tool. However, in Koru Residential Site, this kind of borders is very rare, and they are only in single-family house areas. For benefiting these features of borders, they must be at least visually permeable or semi-permeable. Also, the edge parts of residential sites must be used by residents. During the observation tours in Koru Neighborhood, this kind of interaction is not observed in and between high rise residential sites.

In this fifth chapter, firstly, boundaries of every residential site in Koru Neighborhood are investigated one by one. Then, the residential site's boundaries are examined collectively on four parameters for understanding their effect on

urban. In the last subchapter, residential site boundaries and their functions and features are examined to find out if they fulfill their existence reasons.

CHAPTER 6

CONCLUSION

This chapter aims to remind readers the key research questions, and assumptions which are tested within the scope of this study. Based on the research findings, this chapter discusses them in relation with the theories of boundary provided in the literature of urban design, and offers suggestions for the residential site boundaries in cities. This chapter also discusses about the shortcomings of the study and proposes new ideas for future studies.

The main purpose of this research is to understand the boundaries of residential sites and their spatial impact on urban areas. Starting from the meaning of the term boundary, the emergence of it, and types, their functions and features are examined, and it is found out that boundaries are in the nature of every object and everything, and they have many features and functions. The physical boundaries in city and history, fear of city, and its relation with boundaries are researched. According to many researchers, today's cities' most problematic formations, gated communities, are reviewed. These chapters highlight that physical boundaries that are always a part of a city, are increased in urban areas because of social segregation and fear of city. The thesis aims to study boundaries in a spatial context, so boundaries' relation with urban design principles is examined to understand their impact on urban areas. After defining public and private spaces, it is understood that boundaries are in-between the public and private sphere, and they affect urban areas on legibility, character, continuity and enclosure, ease of movement, adaptability, and quality. The urban design guidelines in different cities are examined to understand how these regulations about borders help to create better urban places. Residential site borders in urban review guidelines have many regulations in detail for having better urban places. Today, almost all residential

sites have their own borders which separate them from the public sphere, and there is an invasion of these borders in residential settlements. For understanding and evaluating these borders, their functions and types are reviewed. Four main parameters are chosen to investigate residential borders which are height, material, visual and physical permeability of borders. The suburban neighborhood Koru (Ankara) is chosen and 52 residential sites are investigated on these parameters.

The first research question of the study is “Do the boundaries and physical borders fulfill the boundary’s features and functions in today’s residential sites?” and the assumption related to this question is “Residential borders do not fulfill their existence features and functions”. The outcomes about this question and assumption are these;

Residential boundaries are mostly shaped by topography. Mostly because of topographic changes and sometimes because of negligence, their height and material changes on different edges of a site’s borders. Because of this, some boundaries cannot fulfill their identity as giving function. The continuous, unique, and not very high and impermeable boundaries fulfill this function. The residential sites that have adjacent borders with the residential site next to them, or in other words, a few residential sites in one parcel, also decrease this defining function of borders. Safety and security needs are the reasons for building residential site borders and other security preventions such as security guards or CCTV cameras. Mostly residential site borders are combined with the preventions towards crime attempts. In this sense, the border’s effect on safety and security cannot be evaluated. However, residential sites with different levels of high and permeabilities are next to each other in Koru Neighborhood, so this shows there is no such significant difference about safety between these sites even though their borders are very different from each other. The desired privacy level is provided with residential site borders, and they can fulfill the privacy provider function of them. Residential site borders create dualism with their existence; however, this

dualism's social effect did not study in this thesis. The borders show ownership and psychosocial territory, especially if they are customized. But customization in borders is very rare in Koru Neighborhood. They are used for dividing and determining hierarchy, help to provide order, and fulfill these functions of boundaries. However, because of their rigid nature, the residential borders in Koru, cannot offer connection and interaction between the dualism's two-part. They are more likely to divide and separate in this neighborhood. So, it can be said that features and functions of boundaries are partially fulfilled in residential site boundaries. For fulfilling these positive features, the residential site's borders must be lower and visually and physically permeable or semipermeable.

The second research question of the study is "how do residential site border's visual and physical permeability level affect urban areas?" and the assumption related to this question is "The rigid residential borders affect urban areas negatively by being visually and physically impermeable". The outcomes about this question and assumption are these;

Firstly, the study found that the number of physical boundaries of residential sites increased in years, so this information coincides with the literature. It is observed that residential sites which are close to each other tend to have similar materials, heights, visual and physical permeabilities on their boundaries, so it can be said that boundary types spread and conglomerate.

There are different levels of visual permeabilities in Koru Neighborhood's residential site boundaries, and most of the boundaries bear a different levels of visual permeabilities. This level of visual permeability is created by the height and material of the border and the topography if the site is highly effects it. While visual permeability of single-family house's boundaries depends on personal choices, as it is summarized in chapter 5.2, residential site's boundaries that are

surrounded with an outer border are mostly impermeable and semi-permeable and later permeable in Koru Neighborhood.

There are examples of borders that are next to the main street with changes in height, material, and visual permeability level. This edge of borders becomes higher, materials become thick plant material, and visual permeability level decreases. The visual permeability levels vary in different parts of borders. Visual impermeability is provided mostly with plant material.

Urban design objectives such as legibility, character, continuity and enclosure ease of movement, adaptability, quality of public realm are highly affected by visual and physical permeability of residential site boundaries.

When a boundary has the same visual permeability level on it, it provides legibility, character and continuity and increases quality of public realm. Continuity can be provided with also rhythm of the visual permeability changes on the boundary. Visually semipermeable or impermeable boundaries create enclosure and visually permeable or semipermeable boundaries, allow eyes inside the residential sites and allow the experience of the residential site's landscape so they support the character of the urban areas.

However visually impermeable sites block visual access to green areas or residential sites for strangers as green spaces have a positive effect on human psychology not only when they are accessed physically but also when they are seen. Therefore, all these visually impermeable sites can be considered as an opportunity loss for having a positive effect on human psychology. According to this research, it is suggested that such sites should have visually permeable and semipermeable borders, especially if the residential site has green areas. This is also beneficial for having the eyes inside the residential site and providing a safer

environment. The parking lots in the sites can be surrounded by visually impermeable or semi-permeable borders to veil bad views.

If the users of residential site prefer visually impermeable materials for privacy or for another personal reason, the borders can be designed only with plant material for making strangers see green. However, the maintenance need for plants must be considered, especially if the plants are deciduous.

Most of the residential site borders in Koru neighborhood are physically impermeable. Moreover, there are lots of adjacent residential sites that block physical access both inside their sites and next to their sites. This decrease the level of ease of movement in neighborhood. People need to walk around the site's borders even they have a shorter and more green option if they could use the residential site. The residential site's gardens have mostly been designed and well-groomed landscapes, but these areas only underused by the dwellers of that residential site. Several studies have proved the positive effect of accessible green areas. If residential sites especially with high rise buildings become physically permeable or semi-permeable, strangers can also benefit from these green areas. It is clarified that providing safety function of borders is not fulfilled. According to Congress for the New Urbanism (2000), providing safety and security is possible with people's eyes on the streets. Therefore, when strangers can use residential green areas, these areas can be safer than their unused times.

Therefore, the second research question is answered, and the second assumption is corrected with these observations and analyses.

The sub-questions "What material is used the most, and what is the dominant height of borders? Does material and height choice affect the visual and physical permeability of borders?" are answered.

The residential site borders in Koru Neighborhood are rarely low and mostly medium height. Material combinations are used rather than a single type of material. The most preferred material is plant. The reason for that can be economic or esthetic. However, plant material's need for maintenance can sometimes be a problem, and it can seem neglected.

It is observed that visual and physical permeability level is not always related with height or material of borders, topography has a more dominant role on visual permeability level and physical permeability is not always about the height and material of the site; rather it can be provided just with a written sign or another security preventions such as security guards or CCTV cameras.

As boundaries exist in every object and every part of human life, it is impossible to get rid of them. This existence have come out with the need for safety, but later on boundaries have gained lots of different features and functions. Even, it can be claimed that the need for safety is totally satisfied by other technologic precautions. However, other functions like being a definer, identificatory, privacy, and ownership provider and other features and functions of boundaries make the existence of boundaries inevitable. As human's need for boundaries grows with the expansion of cities, there are ways to use boundaries in a more positive and connective way.

For defining the site with borders, creating psychological borders to emphasize the territory or keep strangers away, appropriate visual permeability for its health benefits, ecologic and economic savings, it is suggested to use low, evergreen plant material and physically permeable or semipermeable, continuous residential site borders. This can be provided with voids in these low, evergreen plant material borders. Therefore, residents and strangers can use the site's green areas for recreation or transition. The material and height of the borders can allow outer eyes to inside and support human's psychology by seeing greener. This is more

applicable to high rise residential sites. However, it can be adapted to single-family houses if the residents prefer. Customization of borders, by shape, material, or color, is also advisable for defining and creating diversity in urban areas.

If the site users do not want visually and physically permeability on their borders, it is suggested that to use evergreen plant material for its maintenance easiness rather than a deciduous plant. Plant material is also eco-friendly and supports the linear continuity of green and fauna. It is economical than structural elements such as wall, fence, glass, or some of the wire fences. Plant borders also help people to see greener while transitioning next to them and support public health. However, to have a more identified area, these plant borders should not be high or visually entirely impermeable.

To take advantage of visually and physically permeable boundaries, local governments, architects, city and region planners, and landscape architects who design borders can be informed about these factors.

The study examines the residential site borders and their effects on urban areas on the Koru Neighborhood example. The thesis develops a presentation method for collecting data about residential site boundaries for analyzing and understanding their impact on urban areas and finding solutions for negative impacts. Boundaries in urban areas are the urban elements that must be addressed multi-scalar. Because of the lack of regulations of municipalities, the residential site borders are designed and built per personal wishes of users or contractors. However, as it is explained in the study, spatial boundary subject is essential for urban areas, and the regulations for them must be determined as an urban design strategy. These regulations must be prepared in a way that boundaries fulfill their features and functions, and they must support urban quality by following urban design objectives. The guidelines about boundaries must be added to urban design guidelines details in different scales like the examples in chapter 3.3 to create better urban places on every level.

These boundaries must be designed coherently with urban green spaces and public places such as squares, boulevards, streets.

6.1 Shortcomings of the Study and Suggestions for Further Studies

As a shortcoming of the study, the inner formation, inner borders, and their interaction with each other of bordered single-family house residential sites could not be examined because of the physical impermeability of the sites.

The information about the changes in residential borders cannot be evaluated because of the lack of knowledge. These data could give the patterns of the change, needs and how borders change in time. Do they get more rigid, or do they tend to be more open when they rebuild in time? Especially in single-family houses, borders are shaped by personal preferences, but the psychologic factors or triggering factors which form these preferences could not be studied.

While analyzing residential site borders, there are height, material, and visual permeability diversities in most of the sites, and these parameter's amount is passed off in this study. In some borders, a material is much slighter than the others; however, this material is also marked in the tables. So, there is information about the diversities of parameters in a border, but the amount of difference is not. Further studies may have these percentages of these changes, and the same classification with template and maps can be prepared with exact locations for each height, material, and permeability.

In the study, all plant species are counted as the same material, however, different species have different features and affect permeability at different levels. A border in the same height and with the same number of voids, while evergreen plants provide a more impermeable effect, deciduous plants have various permeability

features in different seasons. Different plant species as border materials and their impact on permeability can be examined in future studies.

Physical permeability levels are divided into 3 parts; however, physically impermeable borders have various types such as borders, which are just psychological symbols, borders with written signs, borders with pin codes, or security guards. In this study, if a site is only open to its residents, it is counted as physically impermeable; however, physical impermeability has various types, and further studies can cover them.

The study area is a suburban of Ankara city, and there is not a big difference between social classes in the neighborhood. Even though the site is chosen because of these features, if the study were carried out in a neighborhood where there is a gap between social classes, the results could change. At the same time, if it were carried out not in a suburban area but in the city center, there could also be differences in results.

Moreover, the suggestions of the study could not be tested by real users. The resident's reactions could change if their residential site were under the use of strangers or if the site were visible from outside. Even if the borders are permeable, there is no guarantee for strangers to use this area for recreation and transition. If the residential site's gardens are used actively by strangers, its impact on residents can be tested in further studies. Different levels of permeabilities, heights, and different materials could create various effects on users. In further studies, these subjects can be analyzed and studied.

Moreover, the study can be applied to different cities and different parts of the city, such as city centers or urban transformation sites. It can also be applied to various uses such as educational buildings, hospitals, governmental building sites. These site's borders can be analyzed if they are fulfilling their aims and about visual and

physical permeability and its effect on urban areas. Solutions for more visual and physical access can be generated.

To summarize, boundaries are an inevitable factor of life and almost all disciplines, and they will always be there because of their nature. While their invasion in urban areas increases every day, their existence can be used and manipulated as an advantage for both residents of the sites and for public health.

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