
Research Article

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# BUILDING FLOOR AREA EXTRACTION PROCESS WITH FUNCTIONAL APPROACH IN ZONING PLOTS WITH UNCERTAIN SHRINKAGE

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**ABSTRACT:** In areas where there is a vital human population, it is necessary to establish a certain planning in order to meet human needs. This planning takes the form of zoning formation. Zoning plans, on the other hand, are made based on different identities in their designated area. It is in the form of certain criteria such as discrete, block, adjacent. However, the most extraordinary form of these identities is the zoning island feature, which has a free identity. It is to find the answer to the question of how the structures that will meet the human shelter needs on the islands where the parcels with free properties are located will be built by sitting on the ground. In the study, it is examined how to make these session estimations with the function approach over various zoning plan plots. As a method, the result of a problem with ellipse and linear function logic is based on reaching the result of a problem from the inner to the outer. Examples are given on how to give garden distance amounts with this approach in cases where the criteria are clear or not.

**Keywords:** Free Building Identity, Function, Zoning Status

## 1. INTRODUCTION

Housing is an extension of the individual's need for shelter, and the individual's physiological, biological, psychological, social, cultural, economic and so on. It is a living space where their needs are met, which ensures the privacy of individuals and determines their status. In addition, housing is a product of production, consumption and investment. It is a concept that includes social issues beyond being a living space where individual needs are met [1]. Adequate basic infrastructure such as adequate housing, adequate privacy, adequate space, physical accessibility, adequate security, adequate occupancy assurance, structural strength and durability, adequate lighting, heating and ventilation, water, wastewater and solid waste management, adequate environmental quality and health. The relevant factors are adequate and accessible location in terms of business and basic amenities, and their affordability [1;2]. The word construction is defined in the Turkish Dictionary of the Turkish Language Association [21], as any kind of architectural work, building, house under construction, road, bridge and similar construction, making, creating, creating for shelter or other purposes [3;4]. In the Zoning Law No. 3194 [12], many results have been attributed to the concept of building [3;5].

Building, which is one of the basic concepts of the zoning legislation, is fixed and mobile facilities that include permanent or temporary, official and private underground and surface construction on land and water, and their addition, modification and repair [3]. Zoning plans; It

aims to develop sustainable development, increase the quality of life, create healthy and safe environments at the country, regional and city level, and accordingly determines the principles regarding land use and construction area building conditions. The purpose of the zoning regulation is to determine the basic conditions for the design and inspection of the building in accordance with the conditions of the zoning plan. When the zoning legislation is examined hierarchically, the zoning plans come before the zoning regulations [1]. Zoning, as stated in the terminological sense, is called construction activities aiming to establish a certain order [6]. The ability to direct the use and distribution of available resources through urban planning action gains importance in terms of the benefits that property owners will derive from using this resource [7;8]. Urban planning aims to reduce the tension between environmental and social inequality resulting from growth by ensuring that this increase is redistributed generally and equally within society [9].

Within the scope of city plans, it is a requirement of zoning plans to transform an immovable that has the character of a field into a land by giving functions such as housing, trade and industry within the framework of laws and regulations [7]. Adopting a conciliatory and fair approach in the decisions taken by central and local governments on urban planning, such as ensuring spatial order, efficient and efficient use of sustainability and resources, ensuring life in residential areas, and justifying service procurement, is important in terms of protecting and directing real estate markets [7;10]. In order to determine the current situation of the zoning plans, the planned regions and their development in the future, as a result of the researches to be made on issues such as geographical data, the use of that place, its equipment and financial situation, in order to find the most effective solution, and to ensure that the people of that place where the zoning plan is prepared live in the best conditions.

It is the established jurisprudence of the council that it should be prepared by taking into consideration the criteria related to its unique way of life and style, population, area, social and cultural needs of the people, safety and health [11]. The concept of structure is defined in different ways in different branches of law. In the fifth article of the Zoning Law, the concepts of building and building are regulated. According to this, a building, in its most basic form, is a fixed or mobile facility that can be found on land or in water, which is official or private, and is also built underground or above ground, and includes their modifications and repairs. In general, it is defined as all artifacts that are created by human hands and that have a constant connection with the land [11;12]. In the 5th article of the Zoning Law, titled definitions, many definitions are given and the definition of building is also included. is defined as. [11;13]. The concept of building, in contrast to the concept of building, is a narrower concept. While every building is considered a building, not every building is a building [13].

## 2. MATERIAL AND METHOD

Various methods can be used while the building residence area is given in the field correctly. One of them is the mathematical function method. The function approximation is a demonstration of how nested distributions should be treated as a sequence.

Let G be a topological space and also a group. With the product topology on $G \times G$, if, $m : G \times G \to G$, ve $i : G \to G$, $(g, h) \to m(g, h) = g \cdot h$ $g \to i(g) = g^{-1}$ If the functions are continuous, G is called a topological group [14].

If the function f is a meromorphic function, then there is a function that does not contain the poles of the f function in the infinite S line, since the poles of the function f are disjointed.

R ={z : y1 < İm (z) < y2, 0 ≤ Re(z) < 1} rectangle can be found [14].

ε : z → ζ = e 2πiz
{x + iyj : 0 ≤ x < 1}, { e-2πyj – π ·e 2πix : 0 ≤ x < 1}

draws into sets. Thus, the R region is depicted in the ε(R) ring region, which is expressed with r2 < ζ < r1 inequalities with the help of the ε function and in which the ϕ(ζ) function is also analytical [14].

Automatic Vegetable Classification Model based on SqueezeNet

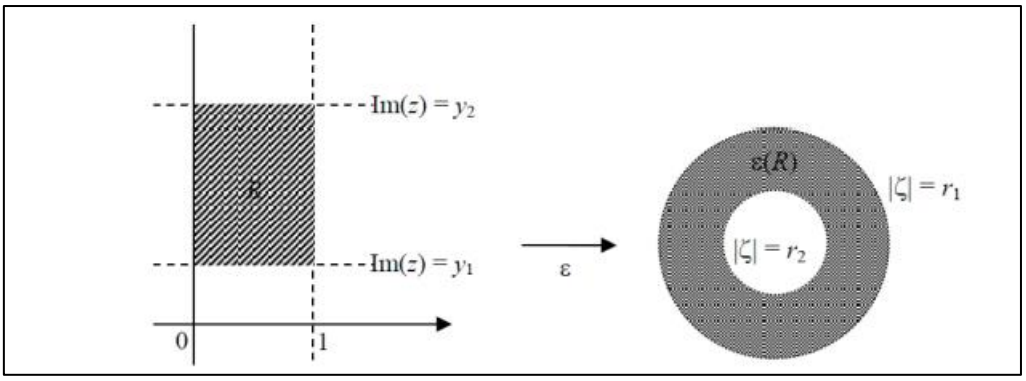


**Figure 1.** The state of the R region under the ε function [14].

In Figure 1, ϕ(ζ) of the function r2 < ζ < r1 valid on the ring region expressed by inequalities olan ϕ(ζ) = n n ∑$an$ζn There is only one Laurent expansion in the form. Thus, the function f(z) y1 < İm(z) < y2 prevailing over the region expressed by the inequalities f (z )$^{ae\ \pi}$ ∞ =–∞ = ∑ It has an expansion. In this expansion e $^{2\ niz\ \pi}$ = cos 2πnz + i sin 2πnz when the value is substituted n ≥ 1 for An = an + a–n ve Bn = i(an – a–n ) including f(z) = a0 + ∑ ∞ ($A_n$cos2πnz + $B_n$sin2πnz) [14].

## 3. FINDINGS AND DICCUSSION

Inner cities are evaluated as zoning areas, and separation and merger operations are carried out on the basis of plots within the framework of planned type zoning regulation [15]. Based on the minimum depth and facade conditions, the parcels are brought to the identity of being able to be built alone [16]. With the function approach, the extraction is done on the ground of the buildings in accordance with the conditions determined by drawing from the inside to the outside or from the outside to the inside. By induction of the form Fog(x)=F((g(X)) [17], the definition of distance called a garden is realized. Of course, this process is done by determining the current identity of the island somehow. parameters such as the ratio.

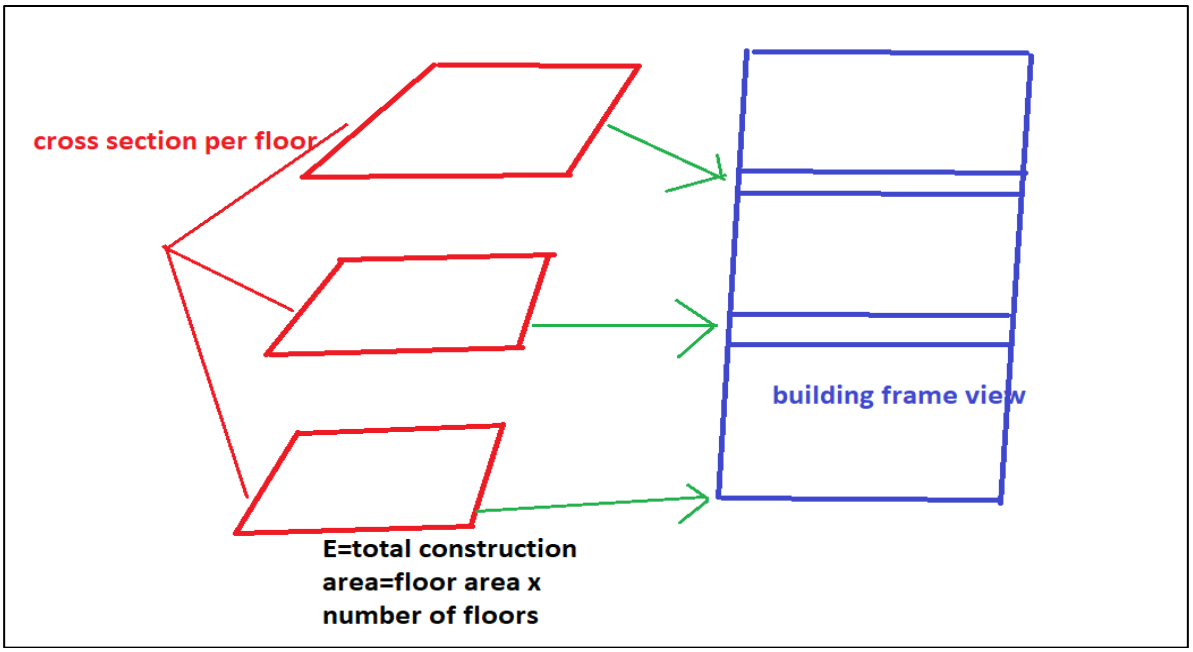


**Figure 2**. Image of Total Construction Area and Floor Area Number of Floors.

Figure 2. gives information about the general view of the building gravity ground dimensions in the zoning blocks given the precedent value or in the plans that give information about the floor area coefficient, number of floors, and the shape of the building.

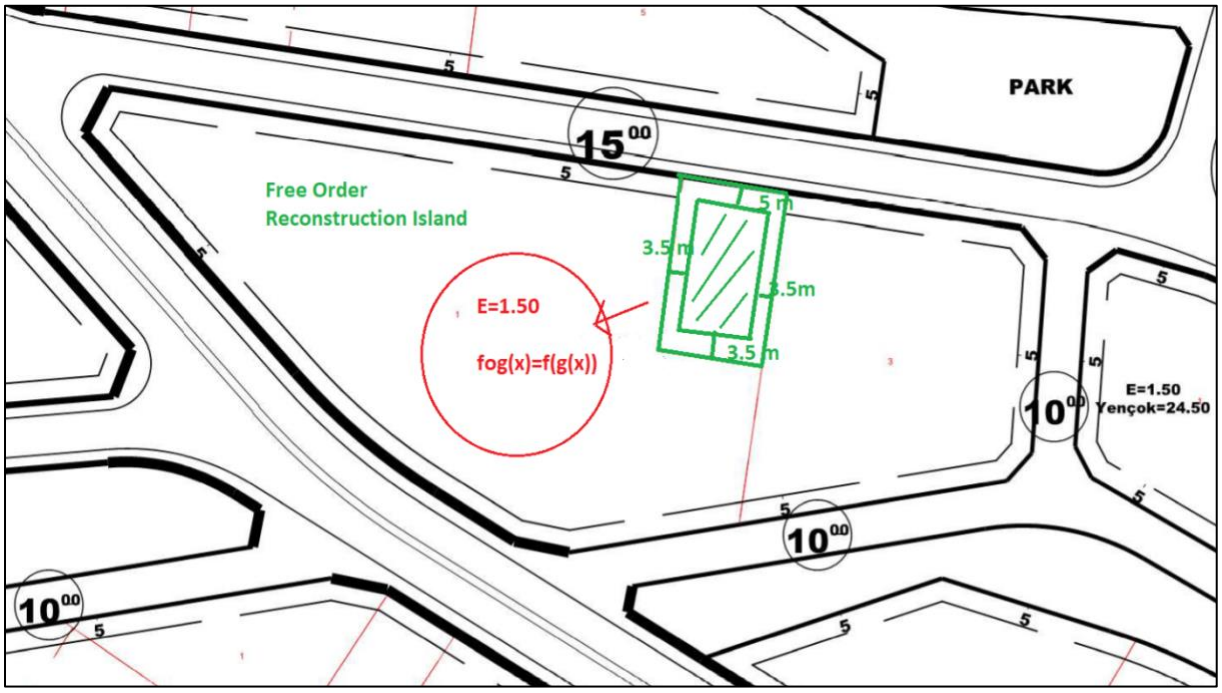


**Figure 3.** A shot of a free island with a precedent of 1.50.

In Figure 3, there is an image of how to apply shooting distances to a parcel with a single-facing road position on the zoning island, which is a free order building. Based on the logic of Fog(x)=F((g(X)) [17], regardless of the identity of the building, a measurement of 3 meters is always drawn from the sides up to four floors. After four floors, the measurement is calculated to increase by half a meter per floor [18]. The part of the garden, which is not visible from the road at all, is called the backyard [18]. It is seen that the total construction area on the sample island will be 1.50 times the title deed area. In an average building construction, the parcel with

a total area of \u200b\u200bwhich is determined in this way can be increased to five floors, using a coefficient of 0.30 together with the ground, according to the type zoning regulation. It turns out that a building with permission can be built [19]. By taking 5 meters from the front, based on places where there is no construction, 3.5 meters from the sides, and 3.5 meters from the back by evaluating as the side [20]. The important point here is that the average number of floors If the building uses its total equivalent by making less or more ratios on the ground, it will be drawn according to the rise or fall of the floor. The measurements are determined since it is a free order. In other words, we take a reference to ourselves and make transactions on these islands.

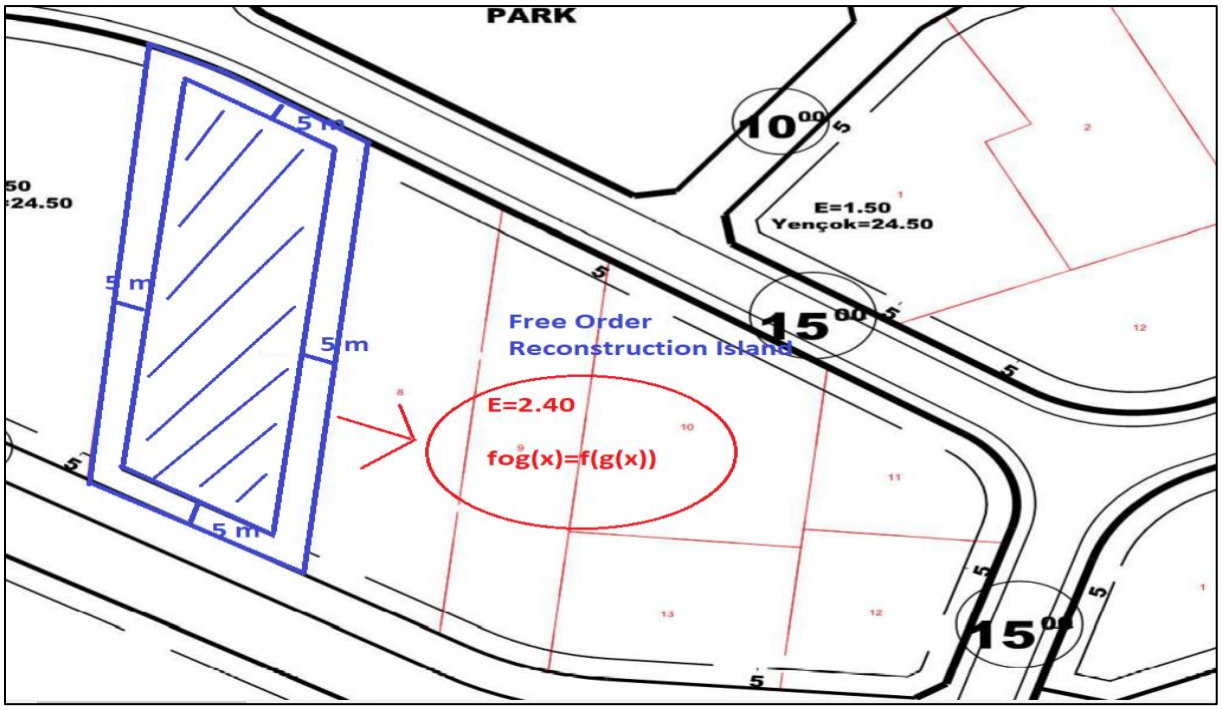


**Figure 4.** A view of an island with a double-sided free-standing building identity with a clear precedent.

When looking at the answer to the question of how to place a building on a free-form zoning island with a certain total construction area in Figure 4., when an item such as 0.30 is included in the planned type zoning regulation or from the council plan grade of the relevant region, the average shrinkage is determined according to the floor to be revealed. If there is no such precedent criterion, then in the island identity, these shrinkage measures are taken into account by looking at the surrounding islands or it should be determined according to a certain floor and it should be noted that there will be an increase or decrease in the shrinkage measures in case of a floor increase or decrease. Fog(x)=F((g(X)) [17], since it is a double-sided parcel with a functionally nested approach, its front sides are determined with 5 meters of gravity. It is given by drawing 0.5 meters for each floor and 5 meters, which is eight floors.

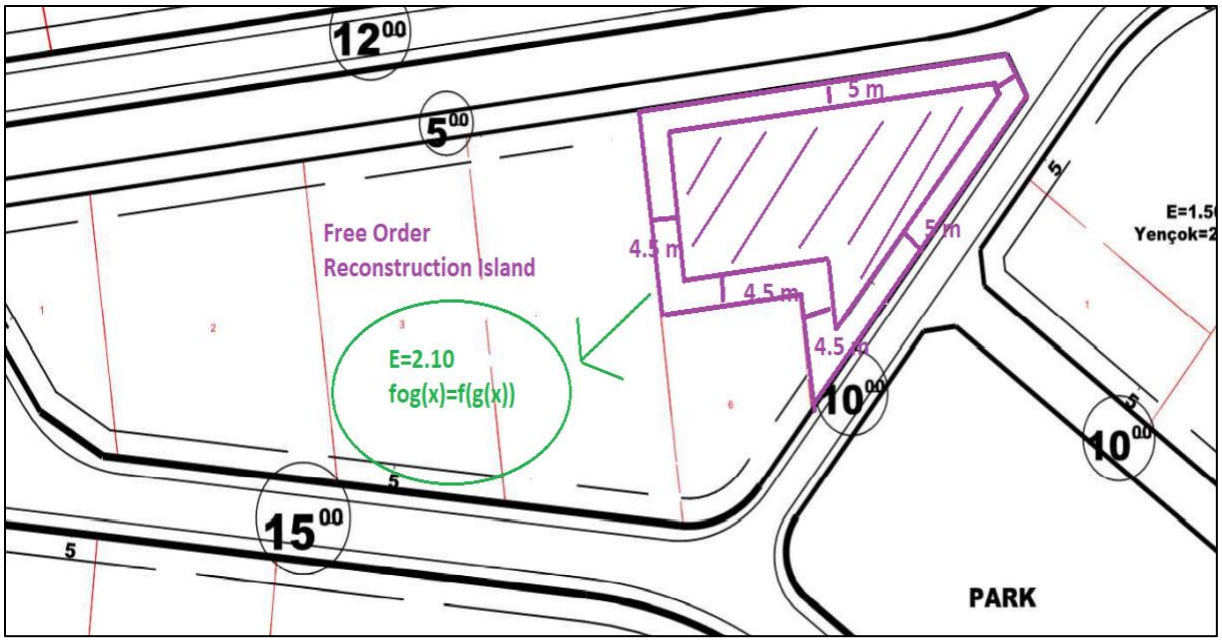


**Figure 5.** A free island zoning status image with a precedent of 2.10.

In Figure 5., there is a different three-sided plot view with the Fog(x)=F((g(X)) [17], approach. Again, the aim is to give an example how to give a diameter in a certain place. The garden distances called side and rear from the total construction area can correspond to seven floors, and the zoning status will be given with a retraction measure of 4.5 meters based on the average floor area of 0.30. If the parcel is fully used on the ground, let's say 0.50 is used and the remaining 1.60 total construction area or by using 0.25 and calculating an equivalent ratio of 1.85 on the upper floors, the drafts narrow and expand accordingly on an island with a free structure identity.

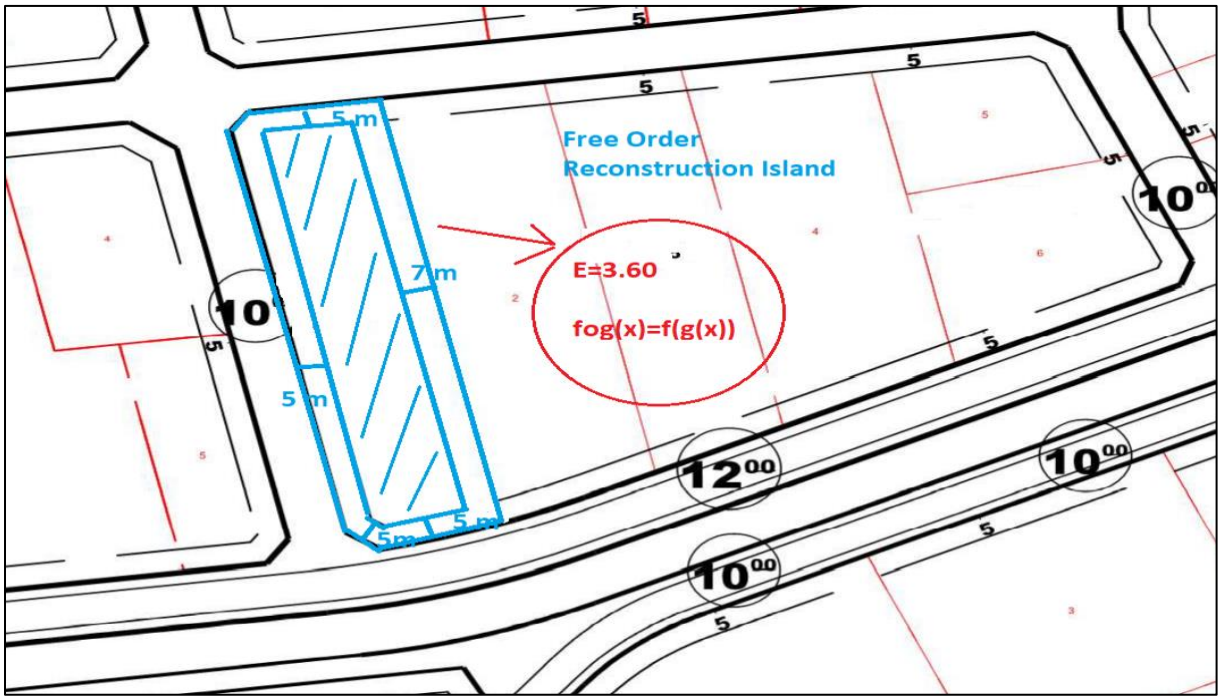


**Figure 6.** An image of a zoning island with a precedent of 3.60.

In Figure 6. Fog(x)=F((g(X)) [17], since a parcel with a free structure from the logical proposition is a parcel with three facades, the average is 0.30 since it will only affect the side garden distance measurement from its peer 3.60 ratio, which is the only criterion parameter. It

is given based on the fixed ratio, but since the ratio is free in a different way, it is applied by pulling elastically [19].

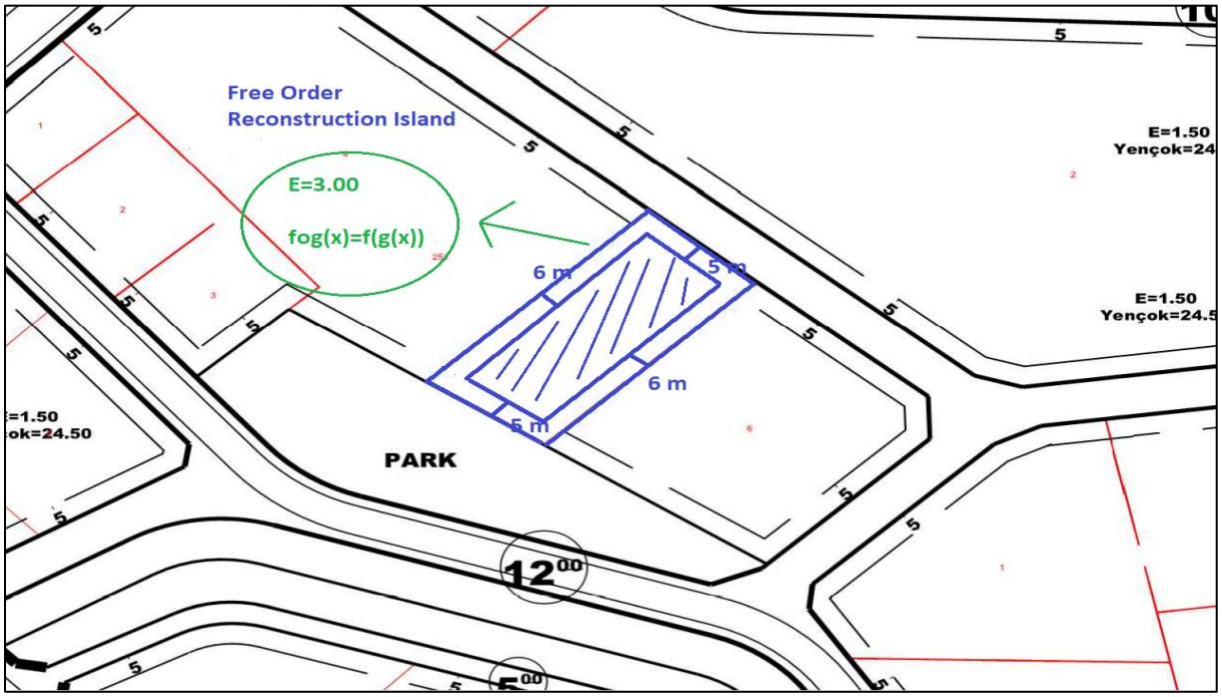


**Figure 7.** An image of a zoning island with a precedent of 3.00.

In Figure 7., the size of the side and the backyard is given in the same proportion, increasing by half a meter per floor, in the zoning blocks for which a building permit is given up to ten floors according to the planned type zoning regulation. If the building ground floor area is considered as a function, such as the definition and value set, the tensile measures will be applied as in the other examples, considering the construction situation accordingly.

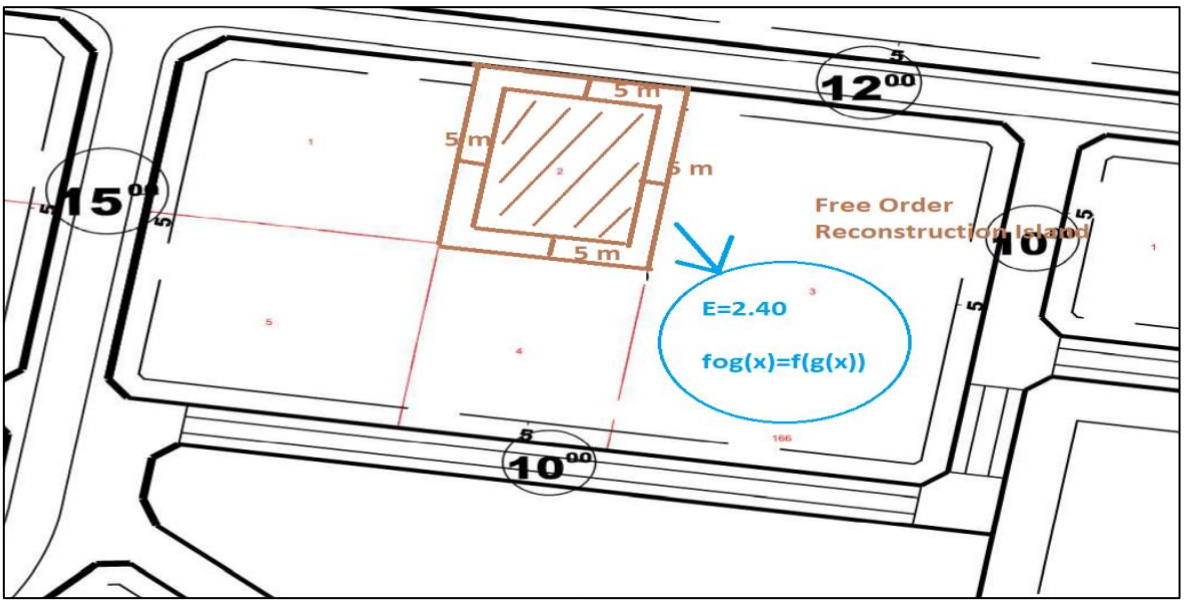


**Figure 8.** An image of a zoning island with a precedent of 2.40.

In Figure 8., since the total construction area of the zoning parcel is 2.40, it is taken as eight floors when it is thought that it will be on the upper floors in accordance with the ground. If this rate is not even there, we set a rate ourselves and leave it to the discretion of the architectural designer, and the zoning status is given in a way that is directly proportional to the floor rate.

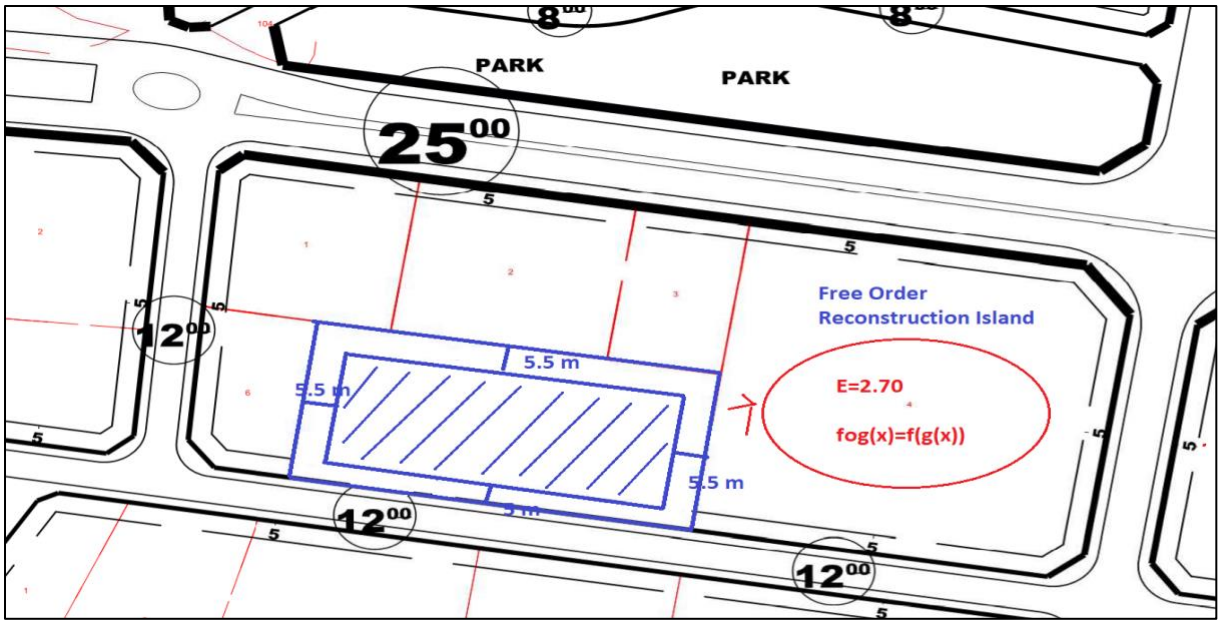


**Figure 9.** An image of a zoning island with a precedent of 2.70.

Garden measurements are given as a conjugate function in real number sets in a single-sided parcel in free building identity. In this knitting, a cross-sectional view is given in order to understand how to give garden dimensions with an average of nine floors.

The aim of this study is to provide the inference of the building floor area from the plans with a special building identity.

## 4. CONCLUSION

It is a demonstration of the task of ensuring that the front, side and rear draft measurements are given correctly by giving examples only on the different precedent values of these islands, since the integral shape of the discrete and blocks are free orders.

- By showing the total construction areas from 1.50 to 3.60, it is shown how the zoning status base process is given in this building identity in planned areas within the city.
- As can be understood from the plan examples, at what height and how the draw distance should be applied,
- Side and garden distances will increase by half a meter depending on the increase in floors,
- The way the floor session is done with the help of angle and distance with the function approach,
- It has been concluded that this session style should be applied by considering all parcels on an island basis.
- Our suggestion, from the point of view of the city and planning, is how the people who will do this should give this ratio if there is such a ratio in the plans.

## REFERENCES


**[1]** Şimşek, E. (2021). Examination of Use of Out of Peer Areas in Terms of Zoning Legislation, Urban Life Quality and Ethics, İstanbul Kültür University, Graduate Education Institute, Architecture Department, Construction Management and Technology Program, İstanbul.

**[2]** HABİTAT II Turkey National Report and Action Plan, https://webdosya.csb.gov.tr/db/habitat/editordosya/file/dokumanlar/Ulusal%20Rapor%20ve%20Eylem%20Plan%C3%84%C2% B1.pdf. (1996).

**[3]** Çağıran, A.C. (2021). Public Benefit Effect of the Arrangement Under the Name of Zoning Peace, Protected by the Zoning Law, Ufuk University, Institute of Social Sciences, Department of Public Law, Master Thesis, Ankara.

**[4]** Akalın Ş.H. (2011). et al., Turkish Dictionary 11th Edition Ankara Turkish Language Institution, Jun: Atatürk Higher Institution of Culture, Language and History Turkish Language Institution Publications, page 549.

**[5]** Ayanoğlu, T., General Principles of Construction Law, Vedat Kitapçılık, İstanbul, (2014).

**[6]** Yılmaz, M. (2001). Zoning Sanctions and Judicial Protection. Ph.D. Thesis, Marmara University, Institute of Social Sciences, Istanbul.

**[7]** Tatlı, A. (2020). Zoning Amnesty within the Scope of Laws Affecting Turkey's Urbanization Process, Implementation of the Zoning Peace Legislation in Ankara, Çankaya University Institute of Science, Department of City and Regional Planning, Urban Design and Transformation Master's Program, Ankara.

**[8]** Campbell, H. & Marshall, R. (2000). Moral Obligations, Planning and the Public Interest: A Commentary on Current British Practice. Environment and Planning B: Planning and Design, 27, 297-312.

**[9]** Adams, D., & Tiesdell, S. (2010). Planners as market actors: Rethinking state-market relations in land and property development. Planning Theory and Practice, 11:2, 187-207.

**[10]** Adams, D and Watkins, C. (2014). The Value of Planning. London: RTPI- Royal Town Planning Institute.

**[11]** Aydın, G.K. (2020). Judicial and Administrative Sanctions in the Scope of Zoning Pollution, Maltepe University Graduate School of Education, Department of Public Law, Master Thesis, Istanbul.

**[12]** Url-1: Zoning Law No. 3194 Amended Version, http://www1.mmo.org.tr/resimler/dosya_ekler/bfd6f93b083f4bf_ek.pdf, Access Date: 04/01/2019.

**[13]** Çelik, L., Altınparmak, C. (2018). The Crime of Causing Zoning Pollution in 101 Questions and Zoning Peace (3rd Edition). Ankara, Seçkin.

**[14]** Kılıç, S. (2013). Elliptic Functions, Uludağ University, Institute of Science and Technology, Department of Mathematics, Master Thesis, Bursa.

**[15]** Taşkaya, S. (2021a). Representation of Zoning Diameter by Distance Approach in Residential Commercial Zoning Islands, Gaziosmanpaşa Journal of Scientific Research, Vol:10, Issue:3, Page:217-228.

**[16]** Taşkaya, S. (2021b). Determination of Zoning Diameter by Distance Method in Zoning Islands whose Height Coefficients are Only Legendary, Journal of Design Architecture and Engineering, Vol:2, Issue:1, Page:36-45.

**[17]** Anonymous Publications, Mathematics Trigonometry Lecture Notes. (2021).

**[18]** Planned Type Zoning Regulation, Official Gazette Date:03.07.2017, Number:30113. (2017).

**[19]** Taşkaya, S. (2021c). Representation of Zoning Diameter by Distance Approach in Commercial Zoning Islands, Journal of Istanbul Sabahattin Zaim University Institute of Science and Technology, Vol:3, Issue:3, Page:204-211.

**[20]** Taşkaya, S. (2021d). Representation of Zoning Diameter According to Distance Approach in Fuel Reconstruction Islands, Recep Tayyip Erdoğan University Journal of Science and Engineering, Vol:2, Issue:2, Page:51-59.

**[21]** https://www.tdk.gov.tr/, (2022).