



GROUND RESIDENCE AREA ESTIMATION OF ZONING PLOTS BY SUBSET METHOD IN BLOCK BUILDING ZONING AREAS

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Abstract

One of the most important criteria when creating zoning plans is the suitability of the zoning parcels as a construction site. A proper understanding of urbanism should be carried out together with housing, trade or other social reinforcement areas. The zoning islands in these zoning plans generally consist of a group of parcels with different identities. They occur within their boundaries as having the feature of discrete, block, contiguous or free structure. One of the ones with this feature is the zoning islands with the feature of block building. In the building blocks with the feature of block construction, the session is made by measuring the measurement distances on the ground, paying attention to whether there is a construction or not in determining the ground settlement areas. Generally, the front dimensions vary according to the fixed side and back dimensions, height and number of floors. On the other hand, building session estimation on the ground can be done with different methods, and when the subset is considered, the parcel behaves like a universal parcel. In the study, it has been examined how to make a building session estimation on the ground with the display of the residential areas from the zoning plans with different seating areas and this structure.

Keyword: Block Property, Subset Method, Ground Session Estimation

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BLOK YAPI İMAR ALALARINDA ALT KÜME METODU İLE İMAR PARSELLERİNİN ZEMİN OTURUM ALAN KESTİRİMİ

Öz

İmar planları meydana getirilirken en önemli kıstaslardan biri imar parsellerinin inşaat yapım alanı olarak elverişliliğidir. Konut, ticaret ya da diğer sosyal donatı alanları ile birlikte düzgün bir şehircilik anlayışı yürütülmelidir. Bu imar planlarındaki imar adaları genellikle farklı çeşit kimliğe sahip parseller topluluğundan oluşur. Ayrık, blok, bitişik ya da serbest yapı özelliğine sahip olarak sınırları içinde oluşurlar. Bu özelliğe sahip olanlarından birisi de blok yapı özelliğindeki imar adalarıdır. Blok yapı özelliğindeki yapı adalarında zemin oturum alanları belirlenmesinde yapılaşma olma ya da olmama durumuna dikkat edilerek zemindeki ölçü mesafeleri ölçülerek oturum yapılır. Genellikle ön ölçüler zeminde sabit yan ve arka ölçüler, yükseklik ve kat adetlerine göre değişiklik gösterir. Zeminde bina oturum kestirim işlemi ise farklı metotlarla yapılacağı gibi alt küme şeklinde oturum alanı düşünüldüğünde, evrensel gibi parsel davranış gösterir. Çalışmada farklı oturum alanlarına sahip çeşitli bu yapıya sahip imar planları adalarından oturum alanları gösterimi ile nasıl zeminde yapı oturum kestirimi yapılması incelenmiştir.

Anahtar Kelimeler: Blok Özellik, Alt Küme Metodu, Zemin oturum Kestirimi

1. INTRODUCTION

The fact that those whose interests are most affected during the preparation and implementation of zoning plans are favored by the plan-making bodies and actors reveals two major topics. First, is the liberal plan and the decisiveness of the capital, or is it a planning approach that adopts a protectionist policy aiming at the welfare and peace of the broad masses? On the other hand, is it a socialist planning activity in which every power and authority is determined from a single source and therefore carried out by a branch of the central authority? This preference is the factors that will affect the planning preparations and applications. The second is urban clientalism. Supporting the transfer of the rent obtained from zoning and planning practices to certain individuals or groups through abuses is the most obvious obstacle to the use of the generated income in favor of the



society. Urban clientalism, as a much studied concept in the context of zoning plans, makes its weight felt in the scientific field. Today, zoning plans, in other words, planning related to zoning, make their weight felt even more as a result of urbanization and increasing migration from rural to urban areas. The increasing population and the desire for quality life disrupt the absorbable dynamics of cities by forcing them, and as a result of this process, the authorities who are in charge of planning are pushing to find new methods and take the lead [7].

In addition to population growth and migration, industrialization, concentration of economic activity area in big city centers, education quality, etc. reasons lead to agglomeration in cities. Infrastructure and superstructure facilities, transportation investments, activities in the fields of health, education, culture and tourism always constitute the main subject of planning [3]. In addition, the protection of the environment, image and natural resources, which are increasingly important today, and the prevention of interference with the naturalness of the vegetation is another aspect of the planning phenomenon. So much so that in order to create housing and other social facilities, which are the most basic needs of civilized people, there is a need for a regular urbanization with livable spaces and new lands to be produced in a planned manner [5]. Implementation zoning plans are in Art.5/2 of the Zoning Law; It is defined as “the plan that is drawn according to the master zoning plan principles with the cadastral status, if any, processed on the certified current maps and that shows in detail the building blocks of various regions, their density and arrangement, the roads and the implementation stages and other information that will be the basis for the zoning implementation programs required for implementation” [7]. In our country, within the framework of urban plans, 1/100,000 environmental plan and 5000 or 2000 master development plans of areas open to development in cities are transformed into 1000 application plans through local governments, and zoning and urban planning activities are carried out in the light of laws and regulations. It is aimed to be implemented in line with the principles of compliance [12]. Rapid urbanization has brought about unplanned development. This process has revealed an urban texture where social and technical equipment areas are insufficient, transportation planning cannot be made, and industrial facilities are intertwined with living and resting areas [13]. The zoning plans can be made by the public with the arrangements to be made in the city and its surroundings influencing investments, encouraging investment, creating a



healthy and beautiful environment terms of the person, the immovable that he owns or benefits from. Thanks to the investments to be made of the value of the goods, the rights of the people can be positive or negative influence is of great importance. For this reason, when making zoning plans and if the public interest conflicts with the property rights of individuals, must be correlated with each other economic, which is important for the development of a city. It is not correct to evaluate activities only in monetary terms. Sustainable and ensuring the economy-ecology balance in the best way for a quality life goal is also plays an important role in planning activities [16].

2. THEORETICAL FRAMEWORK and SCOPE

Zoning plans have a very important role in establishing orderly and orderly life functions in terms of urbanization. In particular, the plans are created by evaluating the basic factors of topography and population. In the plans, zoning islands are created in such a way as to have many different levels of features such as residential, commercial, social facility areas, so that a regular urbanization is formed. On the other hand, the zoning islands have been determined with the aim of arranging the parcels in such a way that a split, block and adjacent structure will be built at the basic level. It has been discussed about the application of this feature in the blocks in the block structure order, especially on the blocks in the block style parcels, in the form of a nested opening of the universal cube, in the way of closing a missing area from the side, according to the logic of creating at least one depth, provided that the withdrawal distance from the other sides of the parcel is given.

In the study, it has been shown how the front garden, side garden and rear towing distances should be drawn according to the number of floors. It has been examined that the drawing distances in the block building regulations are drawn without depending on the population amount or any local region, only by adhering to the factors of the precedent, the floor area coefficient, the total coefficient of the floor areas and the number of floors. Planned areas in block building regulations According to the type zoning regulation, in the planned areas where the provinces, districts and town municipalities are located, the plan notes will not contradict the regulation, with only minor differences, the drawings in the plan samples will be in the same direction.

3. MATERIAL and METHOD

For the clustering process, many clustering methods have been developed by researchers until today. Generally, clustering methods are grouped under two categories as segmented and hierarchical. Convergence and Fuzzy C-mean methods, which are divisional methods, are frequently used for clustering operations. In addition to these standard clustering methods, clustering methods based on optimization methods have been developed recently. Clustering has been applied to many fields such as bioinformatics, genetics, image processing, speech recognition, market research, document classification and weather classification. In addition, clustering has also been applied to document data analysis, which is one of big data learning [2]. Classification can be generally defined as estimating the most probable case of a categorical variable (class) given the values of other variables. For a given set of variables in the database, the boundaries between classes are represented by measures [10].

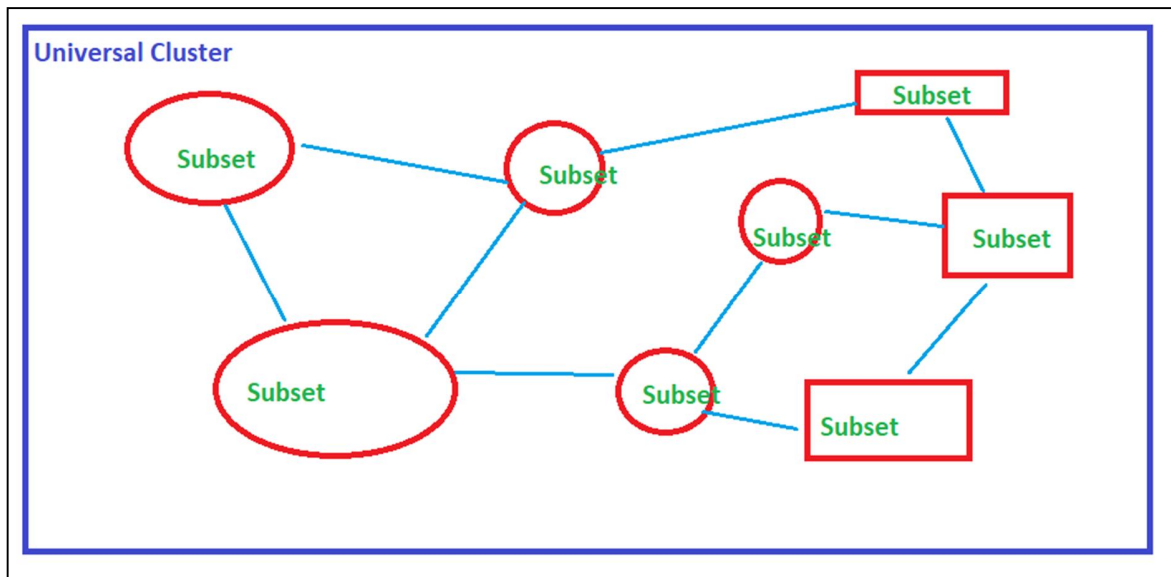


Figure 1. Clustering main logic representation [1].

In Figure 1, if the logic is taken as a cluster from the outside to the inside, the main purpose of our study is to apply the draw distances according to the precedent and the island plan note and feature, no matter what geometric distance finding process is done on the basis of our study.

Cluster analysis is a method that investigates the cluster structures and numbers of data that appear



in different structures. Cluster analysis groups are not exactly known; It is one of the multivariate statistical analysis methods that helps to separate units and variables into similar subsets or groups [6]. The most obvious purpose of cluster analysis is to classify units according to their characteristics [11].

If the zoning island is taken as the basis for the universal cluster, the parcels corresponding to the island are taken as the subset. Soil sessions, which will create the pulling distances that will occur in the parcels that coincide with the island, are defined as the subset. If the universal set is defined mathematically,

$$s(E)=s(A)+s(B)+s(C) \tag{1}$$

$$s(C)c s(B)c s(A) \tag{2}$$

As a subset, A refers to the zoning island, B parcels, and C refers to the residential area. Thus, together with the mathematical simple expression in the form of a subset, the necessity of how to sit on the ground in the block building areas according to certain rules, that is, according to the planned areas type zoning regulation and plan notes, emerges.

4. FINDINGS and DISCUSSION

Relevant local governments make the zoning plans within their own borders. There is a series of steps from the upper scale to the lower scale [4;14]. The first of these is the development and country plans, then the regional and environmental plan plans, the master development plans and finally the implementation development plans that are suitable for urbanization on a local basis. [4]. From this point of view, the work begins by creating clean zoning parcels. The parcels that do not have any problems such as abandonment to the road or creation from the road or that do not have any problems in the façade and the depths are allowed for the construction of buildings [4;15]. With this permission, it is passed to the building construction tour area. The important thing is that the parcels are given the amount of sitting on the ground properly. Thus, regular plots are formed [12].

In the planned type zoning regulation, which entered into force in October 2017, articles were given about garden distances in particular. It is clearly stated that the rear towing distance should be at least 3 meters, especially in the zoning blocks in the adjacent layout style. Based on this, the rear



towing distance should be at least 3 meters in adjacent zoning blocks, and it should be pulled by increasing 0.5 meters per floor after 4 floors, such as in the side garden. However, as long as the plan notes are not contrary to the zoning regulations applied in planned places, studies specific to that region can be carried out with the decision to be taken by the council of the municipalities, which is the relevant institution. In adjacent parcels, the intersection areas of the rear drawbars, which are called lighting, can also be calculated in this way [8]. Before 2017, in the planned type zoning regulation, an application was made at the rear draw distance, based on the parcel depth, the building height, which is called the building depth, which is called L in relation to the rear draw distance. The aim was to remove the whole of the parcel from concrete and leave an area for the population to relax on a parcel basis. Since the TAKS (Base Area Coefficient) event was not taken into account in adjacent layouts, this L was applied as the rear haul distance, together with ensuring the minimum parcel depth and parcel width. If these conditions are not met, at least 3 meters of traction is given and the parcel is given a rear pulling distance. In our study, especially in a local-based region, based on the plan note to be taken from the municipal council, the rear pull distance is taken as half of the height and the zoning diameter is shown.

In Figure 2., zoning parcels are allowed up to 10 floors on a building basis in a zoning island that is a commercial residence. In accordance with Articles 15 and 16 of the Zoning Law, when the parcels are cleared after unification or allotment procedures, an application is made to the municipality for a zoning diameter. Here, too, when giving the zoning diameter, at least one depth must be attached to the neighboring parcel, so the zoning parcel in the north direction is affixed to the south so that it can take a diameter in the future parcels in the south direction. No matter how many floors there are in the block building regulations, the front drawing distance should be 5 meters, if the side garden is clear on the plan, that's it, if not, 3 meters up to 4 floors, after 4 floors, the side garden amount should be increased by half a meter per floor. The side garden distance is 6 meters [9].

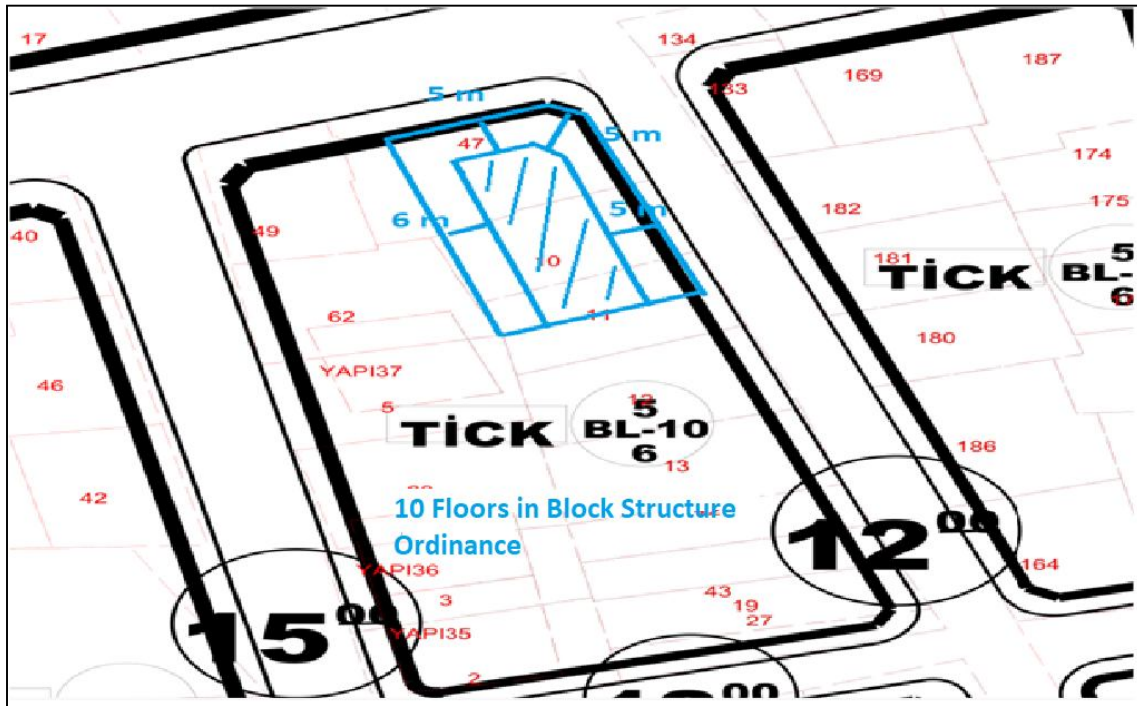


Figure 2. 10-storey parcel display in block building feature

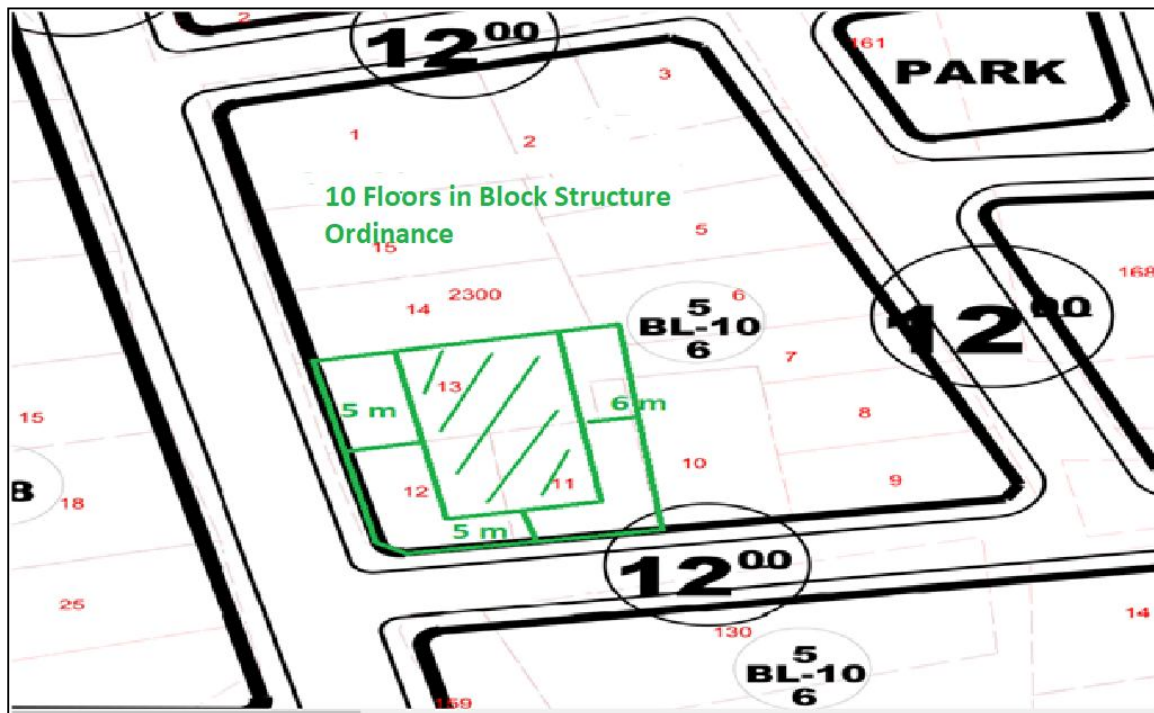


Figure 3. 10-storey parcel display in block building feature

In Figure 3., the residential area zoning island is a zoning island with permission up to 10 floors in the block building order. The zoning island located at the south corner was glued to the north direction, and the front drawing distance was 5 meters and the side garden distance was 6 meters, and the zoning diameter was given. TAKS and total calculations related to the building session will be calculated by multiplying the title deed area with the floor number or by taking 0,40 if the coefficient is not present in the plan, and the total construction area will be found from $TAKS * \text{Building Floor Number} = KAKS$ [9].

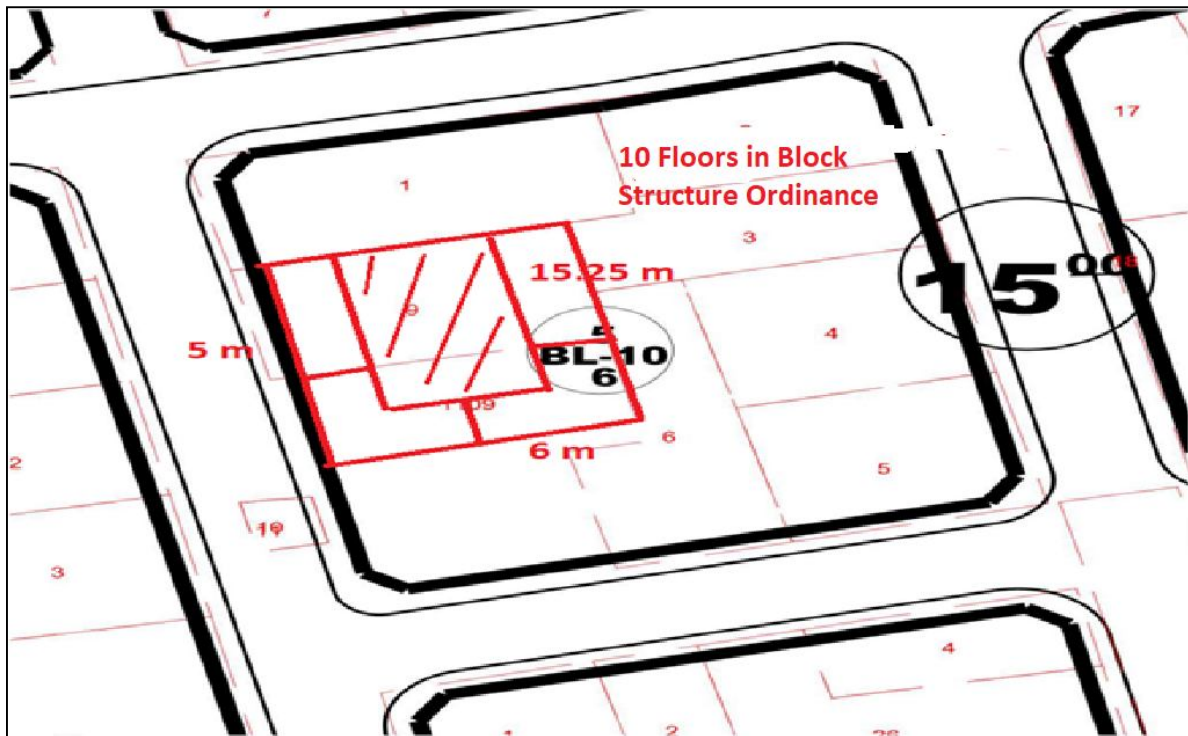


Figure 4. 10-storey parcel display in block building feature

In Figure 4., the immovable in the block order zoning island is allowed up to 10 floors. As the garden distance from the front side, 6 meters from the side, the distance to the back garden has been reduced to half the height, that is, $H/2 = (3 * 10 + 0.5) / 2 = 15.25$ meters. Here, 3 meters is the height per floor and 0.5 meters is the eaves share. If the minimum parcel depth of 10 meters is not provided, the zoning diameter will be given by drawing 3 meters, which is the minimum rear pulling distance condition, instead of half the height of the backyard distance [9].

In Figure 5., when 3 parcels on an island with permission up to 12 floors in the block building order request a zoning diameter after the merge process, the parcel in the south is affixed to the south because its depth is low, and the front drawing distance is 5 meters and the side garden drawing distance is 6 meters, which is the plan. zoning diameter is given [9].

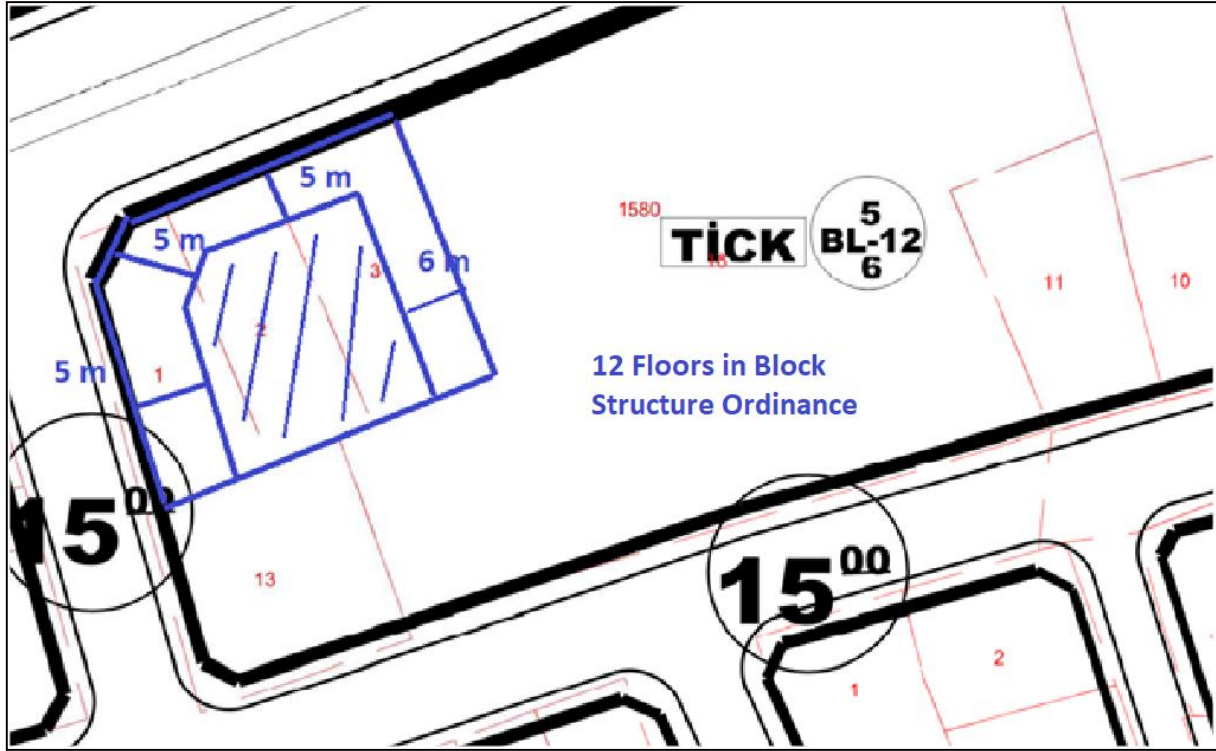


Figure 5. 12-storey parcel display in block building feature

In Figure 6, the parcel located in the east of the island on a zoning island with permission up to 8 floors in block order, when the other parcels of the zoning island are considered holistically, since the surface measurements are high, although it is a block structure, the zoning diameter has been given by converting it into a discrete layout in the middle without the need to stick it to at least a depth. The TAKS plan is given as 0.30, and the total equivalent is given as 2.40 [9].

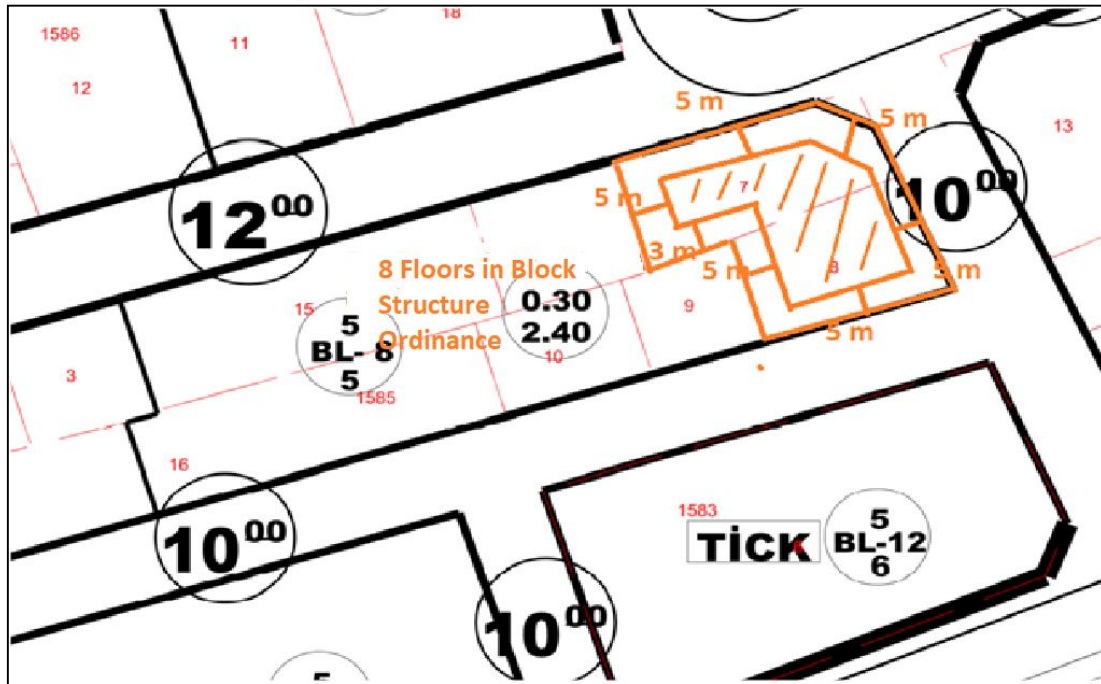


Figure 6. 8-storey parcel display in block building feature

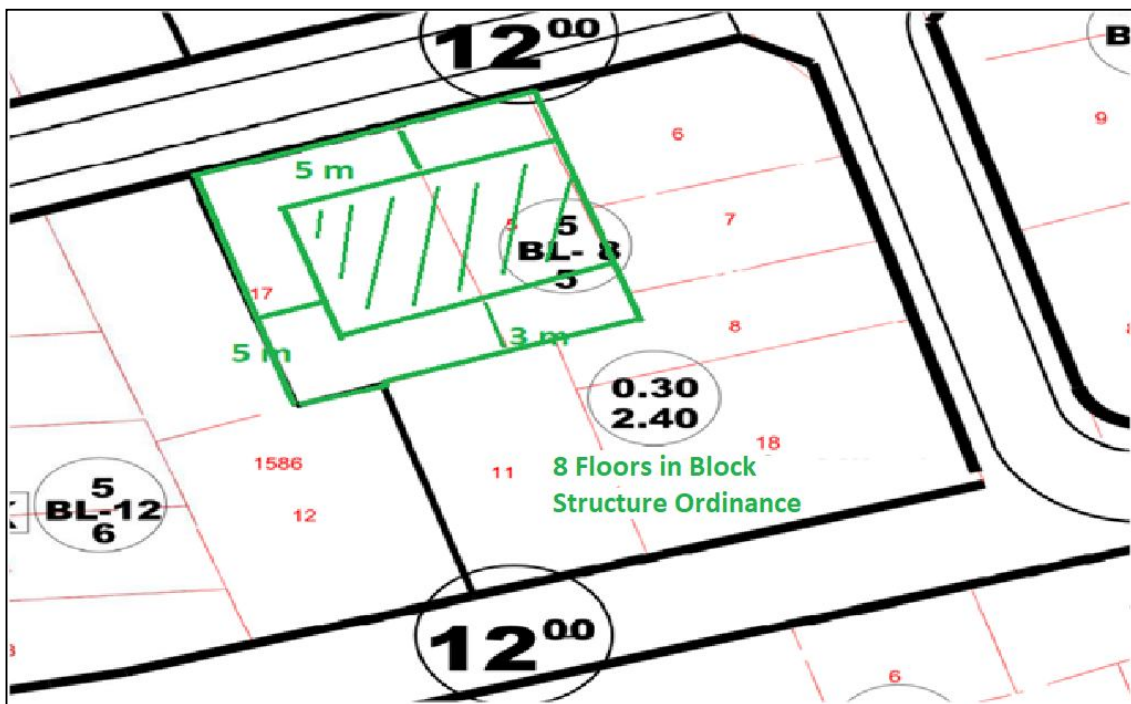


Figure 7. 8-storey parcel display in block building feature

In Figure 7., since the depth of the parcels to the east of the immovable located on a zoning island with a permit up to 8 floors in the block building order is low, it can be glued and the front drawing distance is 5 meters, the side drawing distance is 5 meters, and the rear drawing distance is low, so the depth is low, it is pulled with the condition of at least 3 meters for the zoning diameter. given. The residence area of the building is stated in the plan as the title deed will be 0.30 [9].

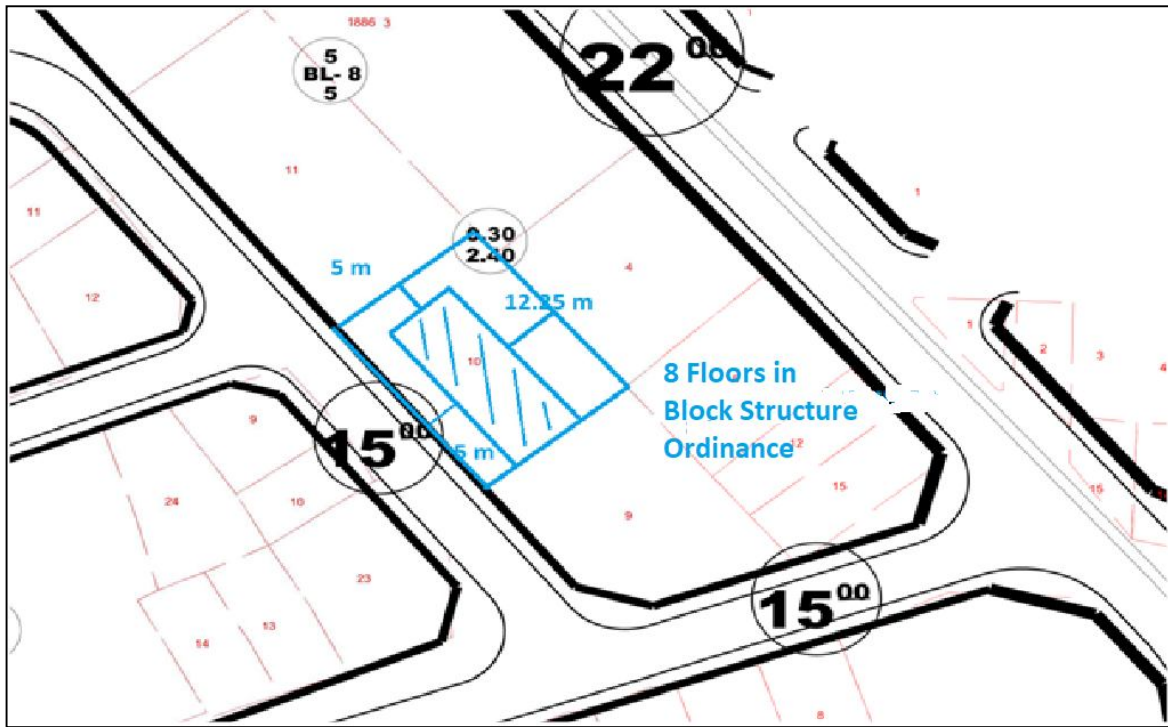


Figure 8. 8-storey parcel display in block building feature

In Figure 8., the zoning diameter is given by sticking the relevant parcel to the parcel in the south of an island with permission up to 8 floors in the block structure order, and drawing the front drawing distance 5 meters, the side garden 5 meters, and the rear drawing distance 12.25 meters [9].

In Figure 9., since the depth of the parcels in the north and south directions of the relevant parcel will be sufficient when they want diameter, and since its area is large, it is transformed into a split arrangement and the front draw distance is 5 meters, the side draw distance is 6 meters, and the back garden distance is 15.25 meters, which is half of the height. diameter is given [9].

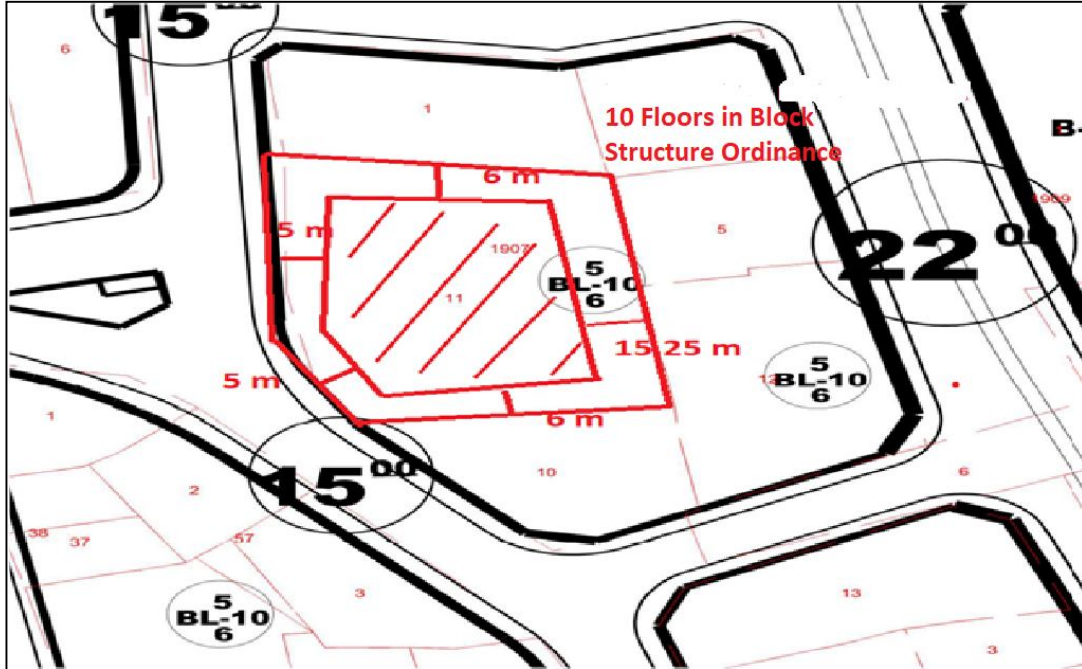


Figure 9. 10-storey parcel display in block building feature

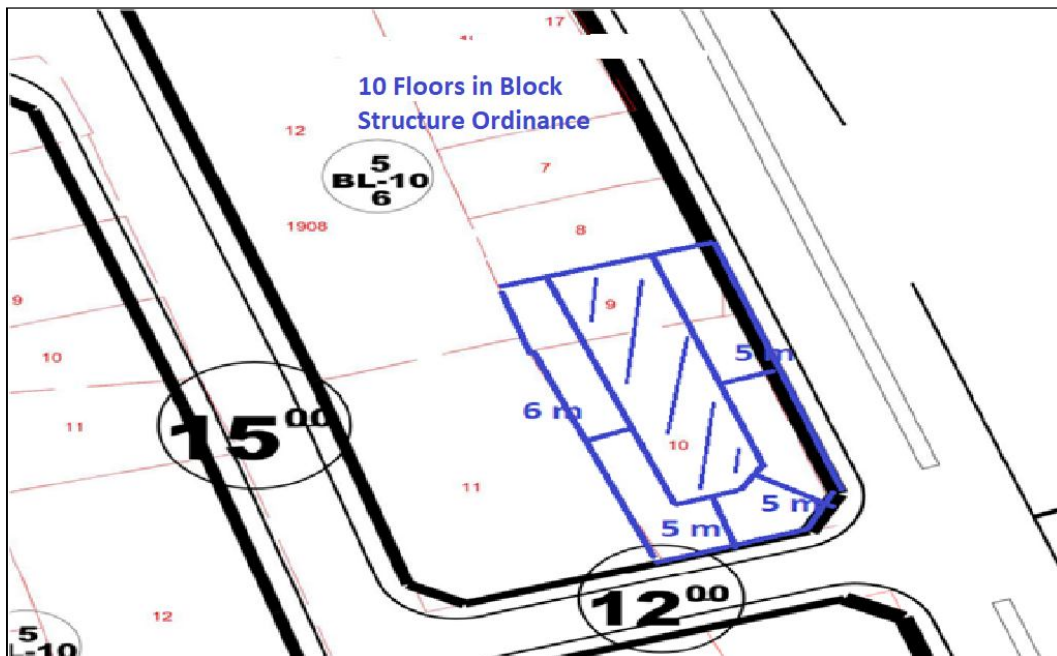


Figure 10. 10-storey parcel display in block building feature

In Figure 10, the front drawing distance to be drawn in a 10-storey area is 5 meters and the side garden is 6 meters, and the zoning diameter is given in the middle by sticking the single zoning parcel formed towards the north of the parcels that have been annexed [9].



Figure 11. 8-storey parcel display in block building feature

In Figure 11., since the zoning island consists of 2 clean large zoning parcels, the zoning diameter is given as 5 meters for the front drawing distance, and 5 meters for the 8-storey area in the side garden, although it is in the block structure in the middle [9].

As it can be noticed from the examples, in the block building regulations, the distances from the outside to the inside of the parcel are made according to the number of floors and the peers of the parcel.

Table 1. Tension garden distances according to the number of floors of the zoning parcels with a block building order

| Number of Floors | Front Garden Distance (m) | Side Garden Distance (m) | Backyard Distance (m) |
|------------------|---------------------------|--------------------------|-----------------------|
| 1 | 5 | 3 | 3 |
| 2 | 5 | 3 | 3.25 |
| 3 | 5 | 3 | 4.75 |
| 4 | 5 | 3 | 6.25 |
| 5 | 5 | 3.5 | 7.75 |
| 6 | 5 | 4 | 9.25 |
| 7 | 5 | 4.5 | 10.75 |
| 8 | 5 | 5 | 12.25 |
| 9 | 5 | 5.5 | 13.75 |
| 10 | 5 | 6 | 15.25 |
| 11 | 5 | 6.5 | 16.75 |
| 12 | 5 | 7 | 18.25 |
| 13 | 5 | 7.5 | 19.75 |
| 14 | 5 | 8 | 21.25 |
| 15 | 5 | 8.5 | 22.75 |

In Table 1, it is summarized how the pulling distances for the construction on the whole floor should be based on the number of floors on the basis of factors that should be especially in the zoning blocks in the block building order. When attention is paid, the front towing distances are taken as 5 meters each, the side garden distances are taken as constant three meters up to four floors, then with an increase of half a meter per the following floor, and the rear gardens are the product of the height and the eaves of half a meter will decrease by three meters per floor, not exceeding a minimum of three meters. With the increase in its share, the planned areas before 201 were applied according to the type zoning regulation by dividing them into two. Today's planned areas according to the type zoning regulation, the only difference is the drawing distances by evaluating the rear distances as a side garden according to the number of floors.

Table 2. Display of towing distances compared to their peers

| Peer Rates | Front Garden Distance (m) | Side Garden Distance (m) | Backyard Distance (m) |
|------------|------------------------------|-----------------------------|--------------------------|
| 0.30 | 5 | 3 | 3 |
| 0.60 | 5 | 3 | 3.25 |
| 0.90 | 5 | 3 | 4.75 |
| 1.20 | 5 | 3 | 6.25 |
| 1.50 | 5 | 3.5 | 7.75 |
| 1.80 | 5 | 4 | 9.25 |
| 2.10 | 5 | 4.5 | 10.75 |
| 2.40 | 5 | 5 | 12.25 |
| 2.70 | 5 | 5.5 | 13.75 |
| 3.00 | 5 | 6 | 15.25 |
| 3.30 | 5 | 6.5 | 16.75 |
| 3.60 | 5 | 7 | 18.25 |
| 3.90 | 5 | 7.5 | 19.75 |
| 4.20 | 5 | 8 | 21.25 |
| 4.50 | 5 | 8.5 | 22.75 |

Table 2 is the summary of the determination of the withdrawals from the total construction precedent as a result of the fact that all garden drawing distances are determined according to the comparable ratios, as in the number of floors, by starting with thirty percent of the tanada parcel and then by multiplying the average rate of 0.30 per floor.

5. CONCLUSION and RECOMMENDATION

It has been seen with examples that when estimating the ground floor area for the zoning parcels with the characteristics of separate, block, adjacent or free structures, it will be acted in the light of the planned type areas regulation. Here, the most important parameters are the characteristics of the islands, the base session coefficients, and the total construction areas together with the height



parameters. After these factors are thoroughly understood, the candidate should be approached in general terms and should move from holistic to specific. The approach dimensions of the neighboring parcels should be approached with extreme precision in the parcels with the identity of a block building, and the measurement distances in the regulation determined to the extent the number of floors must be respected.

As can be seen from the findings and discussion section, after the minimum parcel dimensions are provided in the block building regulations, the determination of the building's residence area is done when the number of floors and the equivalent rates are corrected. These towing distances are given by showing the rear towing distances in line with the regulation before 2017, especially in order to ensure the rate of green space per person between the parcels. It is the process of blindly gluing at least one depth to the other parcel, which should be considered in the parcels in the block structure order. While drawing distances are given in such a way that they coincide with the island, pulling must be applied as if it is given to all parcels on a general basis.

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