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Architectural Design and Its Problems in Batisehir as a Collective Housing Project*

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ABSTRACT

Designing mass housing projects which is prestigious in new settlement areas where the planning phase cannot be fully concluded; without feasibility studies on the current situation of transportation and social structure, causes the architectural design process to be arduous. So, planning and design problems cause multidimensional problems at the same time. In such areas where the current market value of the land is very high; the purpose of the utilization of the construction area to the end of the rights is acquired. This results in the production of multi-storey, high and close massive blocks, which are poor at the point of physical environmental conditions and architectural design criteria are inadequate. In order to start the construction of such public projects, which were started within the scope of special conditional zoning permits in Turkey, they are only licensed with architectural preliminary projects. Since the static, electrical and mechanical projects which should be carried out together with the architectural project are far behind the required point, especially in the construction process, the decisions that are made on the outside of the project in relation to the installation are made. This causes disruption of work programs, resulting in manufacturing faults. Due to the fear of being behind the workflow, the project team is faced with poor quality workmanship due to lack of sufficient time. Collective housing projects, as in the case of Batisehir, face these problems continuously.

In this study, focused on the problems caused by not coordinated project and design process. It is necessary to introduce evaluation and solution proposals on the application deficiencies seen in place and to integrate the changes seen in other projects, especially in the architectural project, to the system and work program. The problems of starting a project-design phase without developing all the solutions for the planning phase are evaluated.

Keywords: *Batisehir, architectural design, collective housing, social infrastructure.*

INTRODUCTION

Architectural representation is a set of tools that enable the concretization of architectural ideas. It enables architects or designers to experience their ideas in an environment other than intellect. Architectural representation is generally understood as architectural drawings. But architectural representation has a much wider range. In addition to the drawings; electronic media, models, holograms, etc. are important parts of this whole [1]. There are several reasons why architects work with representations. Among these, they can use experiences not to represent the real object but to experience it in another environment; the ability of architects to be able to test and measure the design variables and their results with visual models; representations to be safer and reproducible to change or replicate projects prior to construction; have important contributions to the creation of architectural discourse; the fact that representations have an active role in social and cultural structures; architectural representations can be considered as a language characteristic in communicating with colleagues, as well as with other professional groups or the public, and thus allowing rhetorical applications [2]. In this context, the concept of architectural representation should be located in the same plane from a small-scale apartment building to large-scale mass housing projects.

ARCHITECTURAL DESIGN OF BATISEHIR PROJECT

The architectural design process of the Batisehir project was intense and complex. Firstly, architectural projects were designed in 3D by DB architectural office (Figure 1). In the design made within the framework of 'Yeditepe Istanbul'[1] concept, seven multi-storey high-rise buildings have grown around the plot. The blocks outside these high buildings were designed with lower floors and the concept was intended to be adhered to.

[1]Referring to the seven hills of Historical Peninsula of Istanbul.

Figure 1. *Three-dimensional (3D) visualization of the project*

As seen in the layout plan; there are three-lane main structural bodies around the perimeter of the parcel and on the middle axis (Figure 2). The building masses in the middle lane are at a lower height than the structures at the boundaries and have an average volume of eight floors on the soil. The block, which has the highest density of residential units, has a mixed function with residences and offices. The average story height is 3.30 m. and the highest elevation of the project; is 93.00 m.

Figure 2. *Layout plan*

The housing units are placed on the facades of the building body and the center is dedicated to the corridors and cores. The typological analysis found in Figure 3 was integrated into the whole project and the housing independent units were designed. As in the legend, gallery spaces were created along the core axes, up to the technical spaces, and these gallery spaces were covered with skylights at the upper elevations. Thus, daylight is provided to building corridors.

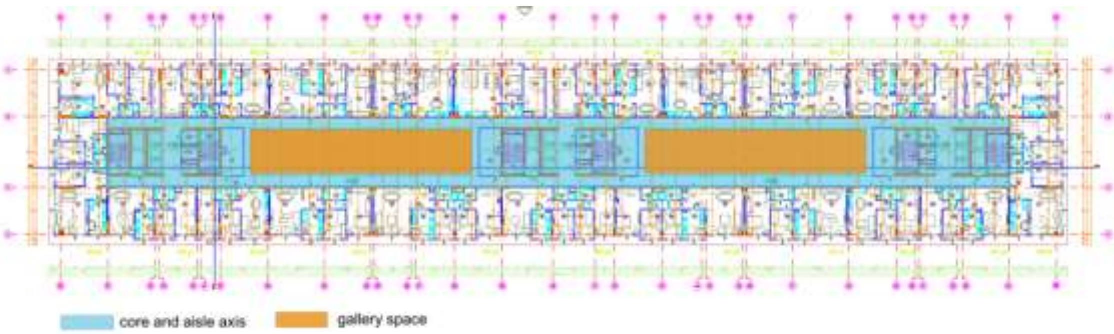

Figure 3. *Structural settlement of housing blocks*

Figure 4 shows the cross-section of the project which is a layout for the silhouette of the building complex. As can be read from this cross-section, which is one of the main elements of the implementation project; the distance of the building bodies to each other has decreased and the slope deterioration has been obtained in the first design (3-dimensional state) in the masses which are reduced in the final layers for a diagonal finish.

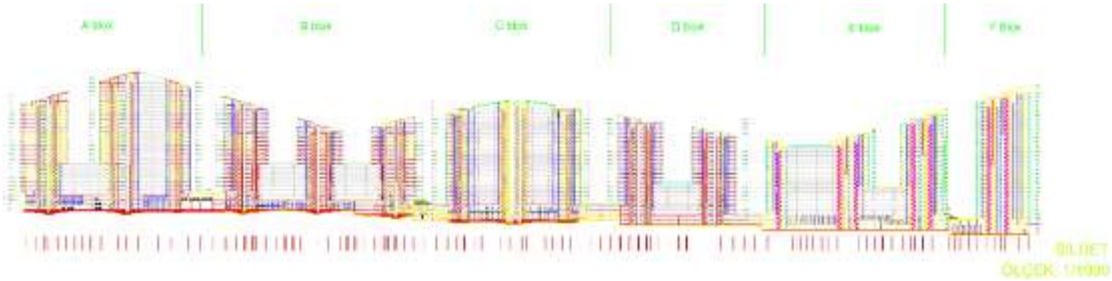

Figure 4. *Cross-section of the project*

The main reason for this situation is the fact that the project has been carried out independently of the three-dimensional design of the building area. In other words, the floor area (FAR)[2]calculations did not fully conform to the mass designed in Figure 1. Thus, in the mass sense, with the three-dimensional visuals in the beginning, more massive structures were obtained than those imagined.

The residence is evaluated not only by its features as a resident product but also by its urban area, new lifestyles and social reinforcements. In this marketing process, the size of the house, the construction technology, the quality of the materials, earthquake resistance, etc. and the urban space, location, infrastructure and housing superstructure facilities where the dwelling is located have become prominent properties in advertising launches [3]. In Batisehir's definition and marketing strategy, it is stated that this mass housing describes an independent comfort zone in the city.

[2]Floor area ratio

Figure 5. *Housing typology*

In the project; consisting of 1+0, 1+1, 2+1, 3+1 and 4+1[3], various residential typology logic can be read from the schematic plan which is an example of 4+1 flat in Figure 5. According to this; the independent units of housing are designed with an open system to the hall of the apartment entrance door in general. So, the entrance has not been drawn as a separate space. In this case; when accessing any housing unit, there is a door opening directly to the hall and a solution that questions the privacy of the living area. On the other hand, the spaces within each house are positioned on a single facade. The structural masses formed along the East-West direction have led to the formation of independent units that take facades from the only south or north. As a result of the fact that the independent units that are repeating each other along the axis, the sleeping and living functions have been realized predominantly on the same axis, on the facade which has the orientation to the building.

In such a huge project, the positioning of the spaces within each individual unit can be difficult to do in accordance with the rules of physical environmental protection, but a design in which most independent units meet these criteria may be the pillar of a qualified architectural project [4].

[3]Bedrooms + living room

The orientation of the structure according to the sun affects the thermal comfort in the structure as much as the conservation of energy, thus increasing the user satisfaction by achieving the desired temperatures [5]. The structure design will ensure solutions to provide natural ventilation and will help protect the energy by reducing heating, cooling, ventilation and air conditioning costs. Physical environment data such as topography, biodiversity, dominant wind direction and climate are the criteria that play an active role in the design of energy efficient structures. The main principle in choosing the location and direction of the structure to be designed is to benefit from the heat and radiation of the sun and to protect it from its negative effects [6].

When the Batisehir project is evaluated in terms of design parameters affecting energy efficiency as a passive system, it is difficult to say that it has a structure with positive points. Climatic conditions such as mass form, solar radiation, air temperature, air movement and humidity are the determinants of energy efficiency and energy consumption of the building. However, the design decisions in this mass housing project do not suggest that building energy performance principles are taken into consideration. The negativities experienced after the completion of the project construction confirm this argument.

The fluctuating performance in public housing in countries such as Turkey, political and economic means is not possible to say that it is dysfunctional. By its very nature, mass housing can yield productive results when combined with the correct methodology and field analyzes [7]. In other words, when compared to the dwellings produced singularly, the mass housing has a positive effect on the construction process. These benefits are listed below [8]:

- Mass housing can contribute to the planned, regular development of cities by creating large sites, balancing housing supply and shanty house etc. help to reduce illegal unhealthy construction,
- Ability to create a housing texture with social reinforcement areas, green area standards and density conditions.
- Ability to prevent the drawbacks of single parcel layout in urban structure as planned as a whole.
- Innovations in the construction method, the realization of large-scale housing production in a short time, the application of new technologies and new materials and organization methods in the production of housing, enabling the control and development,
- Improvement of standardization, cost economy,
- Provides ease of control to managerial organizations in practice,
- To realize the benefits of a regular housing texture in social life,
- Ensuring the integration between socio-economic groups in society,
- Extension of the life of the building by the maintenance and repair of the houses after the completion of the construction.

It can be said that the Batisehir project has a relative difference from its counterparts when examined the basic building stock of Bagcilar district. For example; the project, which is located far away from the public squares and rail system lines, addresses the upper income group. In this context, Batisehir demographics consist of people whose financial conditions are above average and that provide transportation with private cars in general.

Numerical Data of the Project

The area is restricted to the TEM motorway in the south, İSTOÇ in the west of the Trade Service area in the west while it is adjacent to the military area in the north, and in the CBD (Central Business Area) in the east with the Matbaacılar Sitesi.

The construction function of such a large project seems to have contributed to the fact that the production of a non-residential and new development area has become a center of attraction by increasing the market value of the area. However, it is understood that the construction area of the project is much higher than the first designed project of the site with the construction permits, which are frequently repeated when the plan modifications have been made. As can be seen in Table 1, there is a large gap between the first building permit of construction area (235.443, 50 m²) and the last building permit construction area (770.379, 59 m²).

Table 1. *Construction areas according to building permits*

	License date	Total Construction Area (m²)
1	28.06.2011	235.443,50
2	12.08.2011	419.184,59
3	29.09.2011	818.004,67
4	09.03.2012	784.150,92
5	20.04.2012	772.657,98
6	19.12.2013	780.812,00
7	22.05.2014	770.379,59

It is known that, project design followed an intricate way with the construction license because of building license modifications and the realization of the plan modifications. In this context, the total construction area was approved as 770.379,59 m² in the seventh building license amendment while the total construction area was 235.443,50 m² in the project on the date of the first construction permit (Table 1). It is not wrong to say that some architectural and design problems have occurred in accordance with concept and architectural design principles.

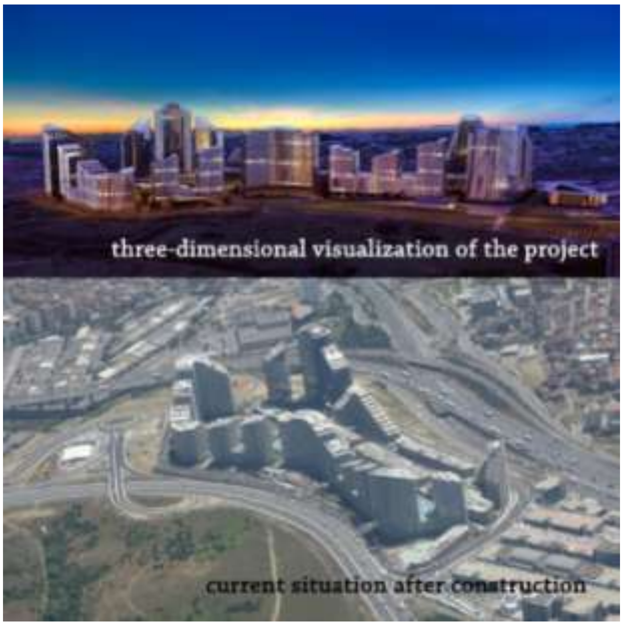

Figure 6. *Designed and produced project*

The three-dimensional image obtained during the design phase of the Batisehir project and the fact that the photographs taken when the construction process is completed are different. That is because of the building permits have undergone various modifications (Figure 6).

Table 2. *Construction areas according to blocks*

		Utilized Construction Area				
N.	**Block**	**Residential**	**Commercial**	**Public areas**	**Out of utilized construction area**	**Total Construction Area**
1	A	45.662,23	0,00	32.370,10	976,28	79.008,61
2	B	36.250,88	0,00	28.880,17	840,50	65.971,55
3	C	38.085,67	0,00	34.645,32	0,00	72.730,99
4	C1	0,00	470,30	5.798,53	0,00	6.268,83
5	D	24.813,51	0,00	20.255,41	552,56	45.621,48
6	E	35.159,67	0,00	29.112,56	2.094,41	66.366,64
7	F	36.907,69	0,00	21.257,64	2.094,70	60.260,03
8	G1	17.152,27	3.050,25	18.091,01	1.166,29	39.459,82
9	G2	10.927,67	0,00	15.491,87	999,41	27.418,95
10	G3	9.394,50	374,04	34.084,73	4.123,42	47.976,69
11	H1	18.627,07	0,00	18.908,23	1.445,76	38.981,06
12	H2	18.783,70	0,00	28.453,82	2.739,42	49.976,94
13	H3	15.127,72	0,00	13.258,08	1.090,61	29.476,41
14	K	23.511,14	23.717,50	75.462,03	7.867,97	130.558,64
15	L	0,00	5.695,38	2.723,67	1.883,90	10.302,95
	Total:	330.403,72	33.307,47			770.379,59
		363.711,19				

According to the final construction license, the areas according to the project are classified in Table 2 in the 1562 island 11 parcels which have 7 building permits together with the modification licenses including the first license project. According to this, 363.711,19 m² of the total construction area of 770.379,59 m² has been obtained from the calculation of out of the utilized construction areas. In other words, as much as the construction area, there are non-useful (counted as not utilized) areas. Therefore, the project's FAR value of 2.20 is far from reflecting on-the-spot implementation.

Table 3. *According to renewed building permits FCR*[4]

	License date	Floor Area	Parcel Area	FCR
1	28.06.2011	15.306,78	144.323,22	0,11
2	12.08.2011	22.448,67	144.323,22	0,16
3	29.09.2011	71.236,34	144.323,22	0,49
4	09.03.2012	79.525,43	144.323,22	0,55
5	20.04.2012	89.042,12	144.323,22	0,62
6	19.12.2013	86.935,89	144.323,22	0,60
7	22.05.2014	86.935,89	144.323,22	0,60

[4]Floor Coverage Ratio

60.24% of the area was built and 39.76% of the area remained in the area of potential recreation. When the transportation axes which should be provided at the rate of 39.76% are included, it would be the proof of social reinforcement to be inadequate because of the increasing floor areas at the base level by renewed licenses. While the first license is an ideal level like FAR= 0.11, this ratio has been moved to a high level as 0.60 (Table 3) [9].

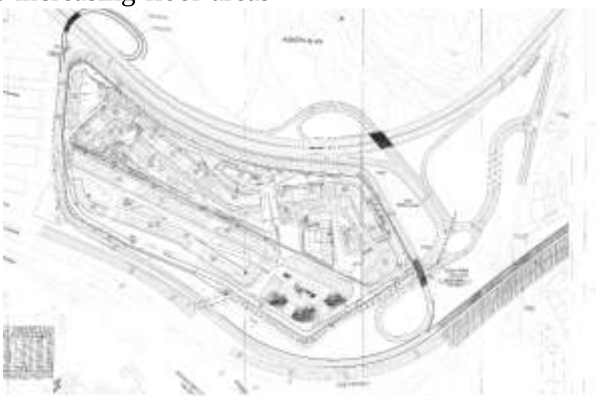

Figure 7. *Final project approved site plan*

When the construction situation in the approved site plan is examined, it can be seen that the roads passing all around the construction area are only roads that serve the project area due to the transportation axes (Figure 7). In addition, due to the projections of the buildings, it cannot be underestimated that there is an intense construction within the parcel.

Table 4. *Total construction areas by building license*

	License date	Independent Units			Floor Area	Total Const. Area	Block quant	Blocks
		Residential	Commercial	Total				
1	28.06.2011	1.020	1	1.021	15.306,78	235.443,50	4	A, B, C, D
2	12.08.2011	1.924	9	1.933	22.448,67	419.184,59	7	A, B, C, C1, D, E, F
3	29.09.2011	3.123	180	3.303	71.236,34	818.004,67	10	A, B, C, C1, D, E, F, G1, G2, G3
4	09.03.2012	3.148	178	3.326	79.525,43	784.150,92	10	A, B, C, C1, D, E, F, G1, G2, G3
5	20.04.2012	3.148	80	3.228	89.042,12	772.657,98	10	A, B, C, C1, D, E, F, G1, G2, G3
6	19.12.2013	3.189	252	3.441	86.935,89	780.812,00	10	A, B, C, C1, D, E, F, G1, G2, G3
7	22.05.2014	3.189	252	3.441	86.935,89	770.379,59	15	A, B, C, C1, D, E, F, G1, G2, G3, H1, H2, H3, K, L

In the first of 7 different building permits for 1562 islands and 11 parcels; there are 4 building blocks, A, B, C and D. Total of 235,443,50 m² construction area and 1,021 independent units were approved for the first building license. On the date of the second building license, 7 blocks; 3rd, 4th, 5th and 6th building licenses were issued through 10 blocks. Totally 15 building blocks were approved on 22.05.2014 on which the latest building license was obtained, and settlement (building utilization) documents were evaluated on the construction licenses issued on the said date. Thus, it is observed that the final project resulted in a total construction area of 770.379,59 m² (Table 4).

Table 5. *The first license and renovation dates of building blocks*

		Independent Units			Building License Approved on		
N.	Block	Residential	Commercial	Total	1	2	3
1	A	386	0	386	28.06.2011	09.03.2012	19.12.2013
2	B	296	0	296	27.06.2011	09.03.2012	19.12.2013
3	C	338	0	338	27.06.2011	09.03.2012	19.12.2013
4	C1	Social facility	7	7	28.06.2011	31.01.2013	-
5	D	199	0	199	12.08.2011	26.04.2012	-
6	E	278	0	278	12.08.2011	26.04.2012	-
7	F	428	7	435	12.08.2011	26.04.2012	-
8	G1	250	9	259	29.09.2011	13.03.2014	-
9	G2	96	18	114	29.09.2011	31.01.2013	-
10	G3	175	13	188	29.09.2011	22.05.2014	-
11	H1	80	0	80	29.09.2011	09.03.2012	-
12	H2	140	0	140	29.09.2011	09.03.2012	-
13	H3	118	0	118	29.09.2011	09.03.2012	-
14	K	405	197	602	29.09.2011	-	-
15	L	0	1	1	29.09.2011	09.03.2012	30.09.2013

When the building licenses issued on a total of 7 different dates are taken into consideration, all building permits, which were arranged after the first license date of 28.06.2011, were arranged in order to meet the higher demand of the construction area. Accordingly, the changes in the construction areas and the dates in which each building permit is issued are shown in Table 5.

Conclusion and Evaluation

It is understood that the Batisehir project has been developed above the first designed project of the construction area with its plan modifications in the location of the project and frequently repeated building licenses. Project design; building permits, building license amendments and plan renovations are in an intricate manner. In this context, while the total construction area in the first building license project was 235.443.50 m², the total construction area was approved as 770.379.59 m² in the seventh building license amendment. In the design process where there has been a construction increase, some functional and organizational problems have been experienced in accordance with the concept and architectural design principles of the architectural project.

While the first license was at an appropriate level of FCR= 0.11, this ratio has been moved to a high level as 0.60. Moreover, these increases did not allow a linear work program to be carried out during the construction process.

In October 2011, four of the construction license amendments of the Batisehir Project, which started construction with excavation from the site, were realized while construction was in progress. The planning process, the project planning, and the process of obtaining the construction license, followed an intricate course with the construction and continued until the settlement. Therefore, although the construction phase has started, the project planning process has continued with constant revisions. Due to the static, mechanical and electrical projects that the revisions were not processed, the location of the flooring reservoirs where the passage of technical equipment is provided has not been properly determined. This situation in the construction process; although the mechanical, electrical and static projects affected by the change of the architectural project had to be produced repeatedly, the necessary projects could not be produced in time.

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