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Architectural Design Process of the 300-Bed Teacher's House Project as a Typical Project

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Abstract

One of the processes carried out in the evaluation of the effectiveness of educational activities is supervision. The buildings that are the guide of this inspection, in which it is aimed to have information about the degree of achievement of the objectives, are the teacher's houses. The 300-bed teacher's house project, which is the subject of this study, is a typical project commissioned by the Ministry of National Education. The aim in typical project design is to provide high-quality alternatives to the users in terms of space, while responding to these different conditions at the highest level possible for the structures to be implemented in different climate, economic and geographical conditions. In this direction, modularity has been tried on the bedroom floors of the teacher's house, and it is aimed that the building can grow / shrink by adding / removing these modules horizontally or vertically. Within the scope of the study, the design and planning process of the teacher's house, which is a typical project, its spatial setup and mass/facade decisions are explained. It is thought that the findings obtained in the research will contribute to similar project analysis by providing information about the architectural project process.

1. INTRODUCTION

Supervision is one of the processes carried out in the evaluation of the effectiveness of training activities. Ensuring development and progress in education is through supervision. In addition, audits are needed in educational institutions for reasons such as ensuring the healthy functioning of the management process, detecting the malfunctions in the system, ensuring the effective use of resources, determining the effectiveness of the practices of the employees and preventing deviation [1]. In the educational supervision, where it is aimed to have information about the degree of achievement of the goals, the organizational functioning as a whole is constantly monitored in a planned and programmed manner, deficiencies are determined and corrected; attempts are made to prevent the recurrence of errors and to achieve a healthier operation [2]. One of these inspection guides is teacher houses.

The main purpose of teachers' houses is to meet the accommodation needs of education staff. In addition, it fulfills the needs of rest and entertainment to the extent of its possibilities. The institution supports activities related to the social and cultural needs of education staff and their development in the field of vocational education, within the bounds of their possibilities. In addition, within the scope of vocational training in enterprises, it contributes to vocational and technical education school and institution students to do internship and apprenticeship skills training [3].

Buildings and facilities belonging to all levels and types of educational institutions in Turkey are planned and built by the Ministry of National Education. Typical projects are prepared and implemented by considering the proposed needs programs suitable for the type and level of education to be given in the buildings to be built by the Ministry of National Education [4]. The importance of educational buildings in education is known and it is stated that the guide published in 2015 should be followed in order to build educational structures suitable for developing/changing today's conditions. General design criteria are

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ideas, goals and strategies for future educational buildings, understanding the place and natural processes, an educational structure for the user, an educational structure for the conscious society/society, being renewable, flexible and adaptable, scalable, comfort conditions, sustainable energy. and environmental sensitivity, divided into 9 sub-titles [4]. The architectural design of educational buildings, for which general design criteria have been determined, covers the whole process, from the thought stage to the construction stage.

In addition to approaches that deal with the architectural design process from an intuitive, systematic and algorithmic perspective, methodical approaches to architectural design have also been influential in shaping architectural design [5]. Yıldırım (2004) explained the design process through 4 basic components, which he called stages. These are designer psychology and mental process approaches, process strategy approaches in design, process structures approaches in design, process organizations approaches [6].

One of the architectural design approaches is modular design and accordingly the concept of flexibility. The modular design approach is the right option for the building to grow/shrink, which is important in type projects. It gives flexibility to the structure. The modular design goes back to Le Corbuseir's "Modulor". According to Corbusier (1954), prefabrication is essential and standardization is the path to excellence. At the same time, it is definitely in favor of accepting the human body as the norm in planning and dimensioning [7]. Le Corbusier's Modulor can be seen as the first important step towards gridal organization in residential design. Gridal organization includes spaces and forms whose positions in space and their interrelationships are arranged by a three-dimensional gridal pattern [8].

In a modular design concept within the grid system, it is possible to make additions, removals and changes within this modular structure and between modules. This change and transformation phenomenon in modular design brings a flexible design with it. Modularity is building complex products and processes from smaller subsystems that can be designed independently of each other and together fulfill a holistic function [9].

Flexibility is the ability to grow or shrink the building and change elements and relationships by adding or removing elements and without losing its integrity [10]. It is important to create a flexible design so that the design can respond to the needs according to the place and time, and to meet the needs that will change later on.

The subject of this study, "Ministry of National Education, 300-Bed Teacher's House Architectural-Static-Mechanical-Electricity-Landscape-Infrastructure Projects" was prepared as a typical project in 2017 by the author of this study. Within the scope of the study, the design and planning process of the teacher's house, which is a type project, its spatial setup and mass/facade decisions are explained. As architectural project stages; information was given about the idea project, preliminary project, final project and application projects. It is thought that the findings obtained in the research will contribute to similar project analyzes by providing information about the project process.

2. DESIGN PROCESS OF 300 BED TEACHER'S HOUSE PROJECT

In the design of the 300-bed teacher's house type project designed for the TR Ministry of National Education, the aim is to provide quality alternatives to the users spatially, while the buildings to be implemented in different climate, economic and geographical conditions respond to these different conditions at the highest level possible. If applied to different parts of the country, the differentiation of the repetitive buildings from each other with small interventions and thus ensuring the preservation of the identity of the building to a certain extent is another important issue. In this direction, modularity has been tried on the bedroom floors of the teacher's house, and it is aimed that the building can grow / shrink by adding / removing these modules horizontally or vertically.

It is the subject of the project service that the required teacher's house projects by the Ministry of National Education are made in accordance with the technical specifications, the needs program and the minimum design standards guide. Projects according to technical specifications;
- Principles of Layout Plan,
- Architectural Project Arrangement Principles,
- Principles of Arrangement of Static and Infrastructure Projects,
- Principles of Arrangement of all kinds of Mechanical Installation Projects,
- Principles of Arrangement of Electrical Installation,
- Earthquake Regulation,
- Fire Regulation,
- Regulation on Energy Performance in Buildings,
- The Shelter Regulation,
- The Standards for the Disabled and the guide prepared by the General Directorate of Special Education and Guidance,
- Noise Regulation,
- To Turkish Standards,
- It should be prepared in accordance with the needs programs to be given by the Ministry of National Education, the Educational Buildings Minimum Design Standards Guide, the regulations and other standards that will be relevant to this project.

Material recommendations to be used in the construction of the education and training facility will be chosen as materials that are resistant to use and impacts, and do not require maintenance and repair for many years. Due to the fact that the training facilities will be built in different climatic regions, at least three alternative facades (separately considering the roof applications according to the regions) should be designed.

The architectural project stages (Figure 1) are the architectural idea project in which different concept alternatives are studied, the preliminary project in which the selected idea project is detailed, the final project prepared within the framework of the agreement reached on the preliminary project, the application project in which other discipline projects are included in the process and the detail and manufacturing projects are prepared. Between these stages, the best solution was tried to be reached as revisions and feedbacks. During the implementation project phase, three different alternative facades (in a massive framework) were designed, suitable for different conditions such as different regions and climates.

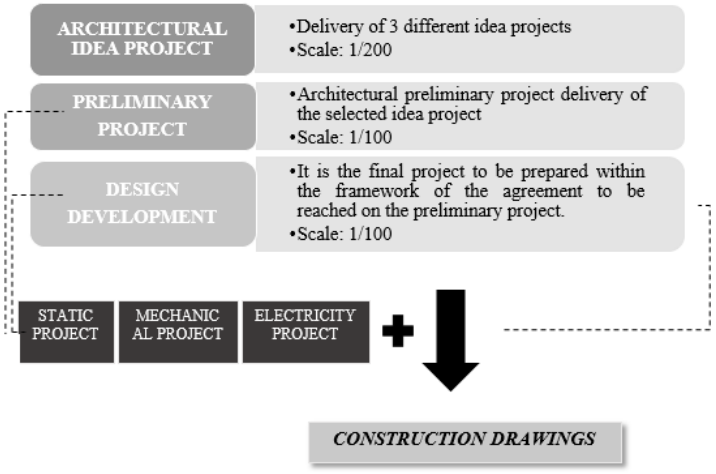


Figure 1. *Teacher's House architectural project stages*

According to the needs program given by the administration, a building with a total construction area of 13000m2 is envisaged (Table 1). The building will be entered from an entrance section where the reception and reception hall are located. The second main heading of the needs program is the management section where the manager, assistant manager, administrative room, archives and offices will be. Bed units and social facilities where rooms will be located in accordance with the function of the teacher's house are other

titles. In technical services, there are spaces for mechanical solutions such as heating and cooling of the building and electrical solutions such as lighting, which meet the energy needs of the building.

Table 1. *300-Bed Teacher's Home Building Needs Program*

A- ENTRANCE, ACCEPTANCE HALL AND RECEPTION	*The building will be entered through a main entrance with a windshield and a disabled ramp will be arranged at the main entrance. *Adequate lobby area will be created according to the capacity, and the reception hall will be arranged with the opportunity to sit in groups of 4-6 people. There will be a reception desk inside, there will be accounting, control and safety services behind the desk, and a bar for 8-10 people will be planned in one corner. * It will be designed to provide stair and elevator control. * Enough female/male WC and 1 handicapped WC will be considered. * For the exit to the bedroom floors, an elevator for at least 6 people capable of carrying a patient on a stretcher and a main staircase with a minimum arm width of at least 2.00 m will be built.
B- MANAGEMENT DEPARTMENT	- Principal's office - Deputy Manager's Room - Administrative Chamber - Archive
C- BED UNITS	- Bedrooms (x150) - Suite Rooms (x8) - Disabled Bedroom (x4) - Staff Bedroom (x6) - Floor Office - Relaxation, TV room
D- SOCIAL FACILITIES	- Dining Hall - Breakfast room - Multipurpose hall - Fitness Center - Hairdresser/Barber - Sales Units
E- TECHNICAL SERVICES	- Heat Power Station - Storage Tank - System Control Room - Main Distribution Pano Room - Air Conditioning Plant - Generator Room - General Depot - Laundry - Kitchen Compartment - Shelter

A function diagram was created according to the requirement program given as the first step of the architectural design (Figure 2). In the diagram studies, attention was paid to the spaces that are related to each other and the elevations where the spaces should be located.

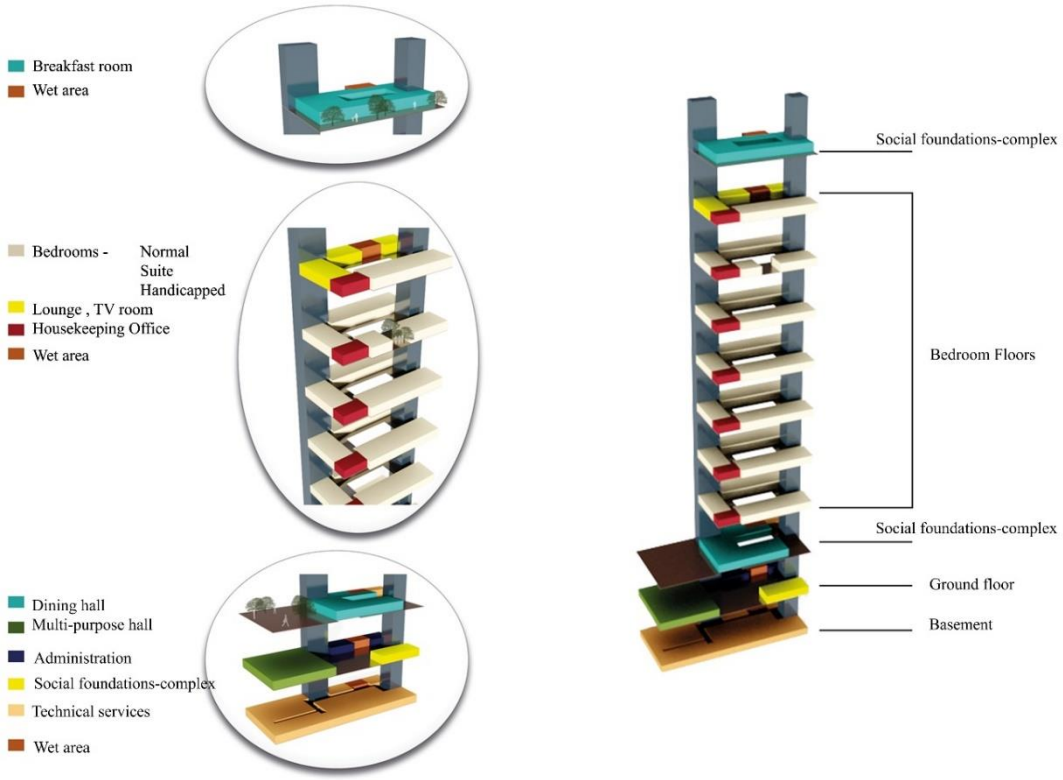
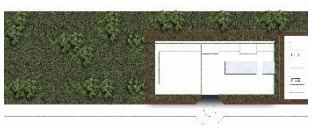
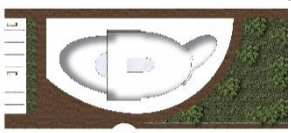
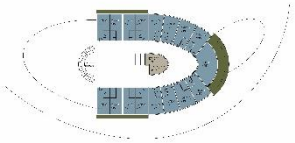
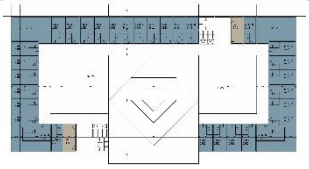


Figure 2. *Function diagram*

Educational buildings and teachers' houses, which are in the nature of supervision, are structures that have spatial memory and are offered to the use of different generations with their features and imaginary stances. The quality of life and experience in these places is affected by spatial fiction and architectural design. In the teacher's house design process, which is the subject of this study, it is aimed to have a strong social relationship with the space, as well as the needs program and physical needs. Since it will represent the Ministry of National Education and it is an educational structure, it has been considered as a prestige structure, and aesthetic concern has been kept in the foreground. In this context, three different idea projects (Table 2) prepared in line with the needs program were presented to the administration.

Table 2. *Idea project alternatives*

	ALTERNATIVE-1	**ALTERNATIVE -2**	**ALTERNATIVE -3**
Layout Plan			
Typical Floor Plan			

Section Perspective			
Perspective			

At the idea stage of designing the 300-bed teacher's house, the starting point of the first alternative was to apply it to different lands in different sizes. In this direction, a modularity was tried on the bed floors, and it was aimed that the building could grow/shrink by adding/removing these modules vertically or horizontally. Optionally, floor gardens can be obtained by removing certain modules on these floors. In line with the needs program, the multi-purpose hall was placed on the ground floor and designed with a separate foyer. The dining room is on the first floor, and the breakfast room is on the top floor with the terraces. Apart from the main vertical circulation, a separate circulation connecting these dining halls and the kitchen was designed. Emphasis was placed on making use of natural light in all spaces in the design. The gallery space on all floors reaches the upper cover and takes the light directly to the floors. In addition, by adding sunshades to the floors, both shading is provided and it is aimed to address the horizontal-vertical emphasis balance on the facade. The floor area of the first alternative is 1.464m2 and the total construction area is 11,364m2.

The 2nd alternative, which has a floor area of 2.217m2 and a total construction area of 12,344m2, is intended to be compact, simple and functional when making design decisions. As a result of the search for a modern façade and form, a more organic form, which is elliptical, has been achieved. The bedroom floors have become transparent, and it is aimed to break the human scale ratio by becoming transparent with the glass curtain wall. As a result, natural light will also be utilized. Reading the function from the facade is provided by the elevation of the vertical circulation glass, bringing movement to the facade. In line with the needs program, the multi-purpose hall was solved on the ground floor with a separate entrance and foyer. The dining and breakfast room is one floor higher and is designed with a common kitchen. The terraces at this level, which can also be seen from the upper floors, are open/semi-open spaces of the dining and breakfast room, and are shaped like an elliptical in accordance with the general architectural language. As a result of considering the building as both accommodation and prestige building for the Teachers' House type project, it is aimed to be a modern design that uses the materials and construction technologies of the day as well as simplicity.

In the idea project stage, the design decisions in the 3rd alternative design were taken in line with Turkish architecture and aesthetic criteria. When the teachers house building is considered on the plan plane, the courtyard plan scheme [11], which started to be used in Central Asia, was preferred considering its functional suitability. The central space tradition [11] was adhered to, and the building was accessed from the center. The entrance foyer and administrative units were solved in this center, and a lapped dovetail dome was designed as the upper cover. The dome form that allows the natural light in from the top and which is named as "lantern dome", "lapped dovetail dome" or "overlap cover" has a deep historical background having a long period of use and a large geographical vastness from Central Asia to Anatolia. This perpetuity shows that cultural continuity brings along architectural identity [12]. The lapped dovetail dome, in general terms skylight provides impressive spaces, lighting the space by taking the light from the

top and from a single point, along with the use of light and the overlapping form of the dome. In the design of the teacher's house, this cover was preferred and it was aimed to make a contemporary interpretation and it was thought that it would contribute to the sustainability of architectural traditions. The two courtyards in the building are placed in the center symmetrically. While one of the courtyards forms the open/semi-open space of the dining hall on the ground floor, the other is interpreted to be used on the upper level as the terrace of the multi-purpose hall on the ground floor. The bedroom floors are designed symmetrically to the center so that they can see the courtyards. Thus, both rooms and corridors could benefit from natural light. The entrance, on the other hand, was solved by placing an entrance portal, referring to monumental structures in Turkish Architecture. Large-scale facade elements have also emerged as a result of the analysis of monumental building facades of Turkish Architecture in line with design decisions. The living area of the building is 3.000m2 and the total construction area is 12.525m2.

The first alternative, which is the selected project, was prepared in line with mutual negotiations with the administration, again according to the needs program, the points specified in the technical specification, the points to be considered and the preliminary project preparation legislation.

At the next stage, final projects, which are final projects, were prepared within the framework of the agreement reached by the ministry on the preliminary project. In the final design development, all the issues that were not determined in the preliminary project and were not finalized in the preliminary project should be shown. All the information of the static and structural projects, whose preliminary projects have been completed, should be reflected in the architectural final projects, and the explanation details of the parts of the building that are not shown in the preliminary projects, which are related to the construction system, should be given. After the examination of the final project submitted to the approval of the administration, the implementation project phase was started.

The program of the building basically consists of two topics: Accommodation and social facilities for the users. In line with the building requirement program, the social facilities were resolved as a different (less storey) block from the main building. The dining and breakfast hall is on the ground floor of this block, and the multi-purpose hall and foyer are on the first floor. The entire first floor is reserved for the administration, and administration rooms and meeting rooms are located on this floor.

All technical volumes and shelter are located in the basement. At the same time, the fitness room and hairdressers for the user are also located on this floor. The ventilation of the basement is solved as mechanical ventilation.

Vertical circulation is available in three different ways and from different points of the building. Two of them are fire escapes and one is the main elevators. There is also a stretcher elevator in the building. Inside these vertical circulation masses, a cable room and floor office are also designed for each floor.

Figure 3. *300-bed teacher's house basement floor plan, Çelik, 2017*

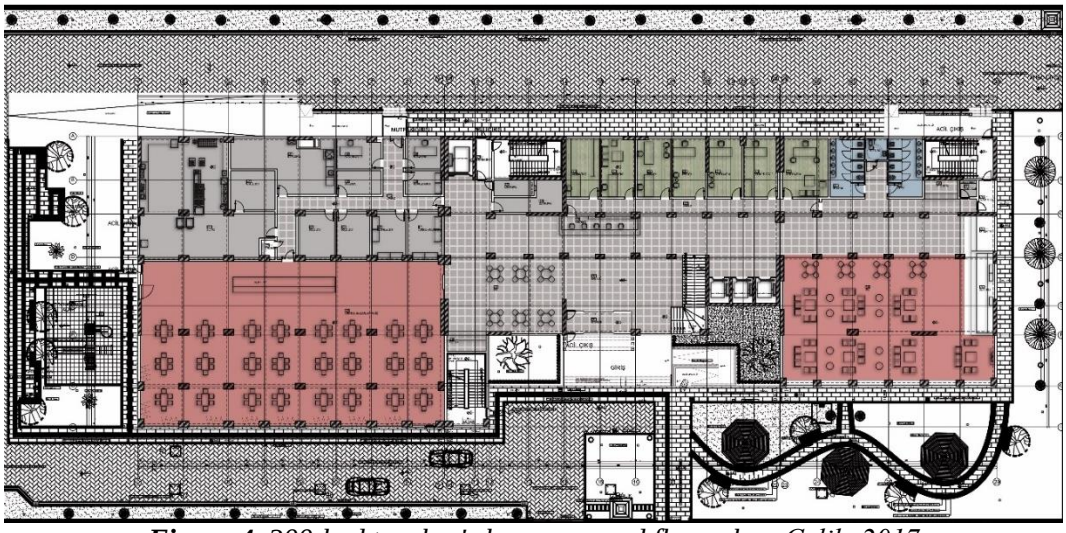


Figure 4. *300-bed teacher's house ground floor plan, Çelik, 2017*

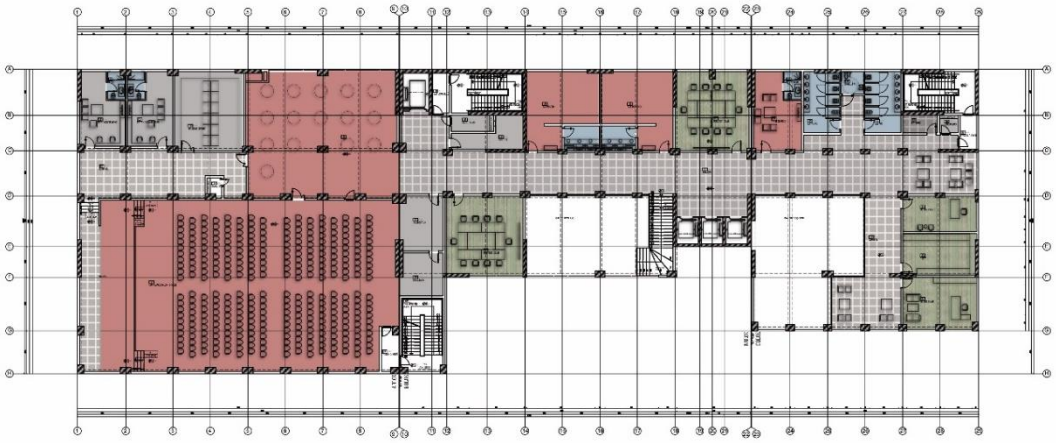


Figure 5. *300-bed teacher's house first floor plan, Çelik, 2017*

Figure 6. *300-bed teacher's house regular floor plan, Çelik, 2017*

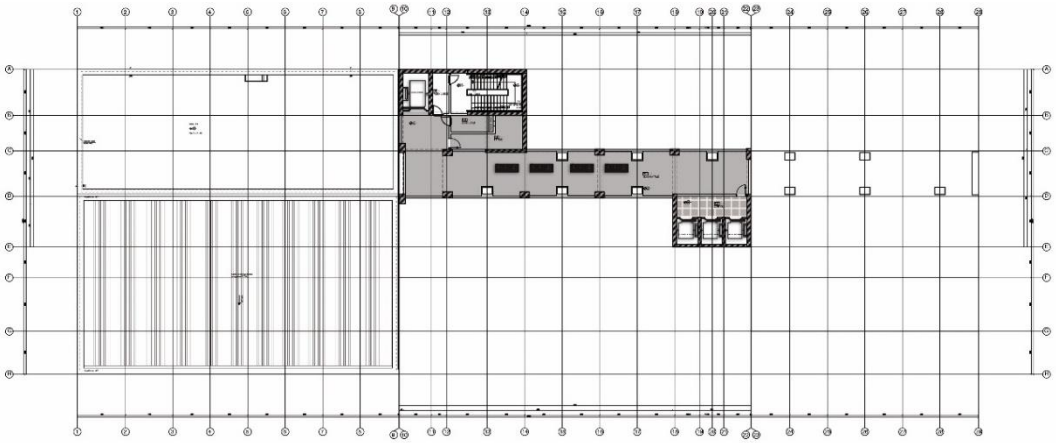


Figure 7. *300-bed teacher's house ninth floor plan, Çelik, 2017*

Building has been designed according to the fire escape rules and distances specified for training buildings in the building fire code. Fire escapes are provided by 3 fire escape ladders and exits are given from the ground. The building has also been designed in accordance with the accessibility regulation and it has been ensured that all users as well as disabled individuals can access every place.

A holistic approach (Figure 8) was preferred in the design. Plans, sections (Figure 9, Figure 10) and facades (Figure 11, Figure 12, Figure 13) were studied simultaneously to feed each other. A design process has been experienced, in which the decision of the plan, in which the return to each other is made, affects the façade, and the decision of the façade affects the spatial setup.

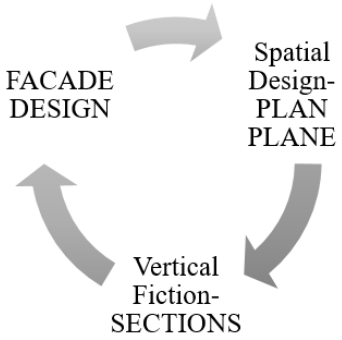


Figure 8. *Design approach*

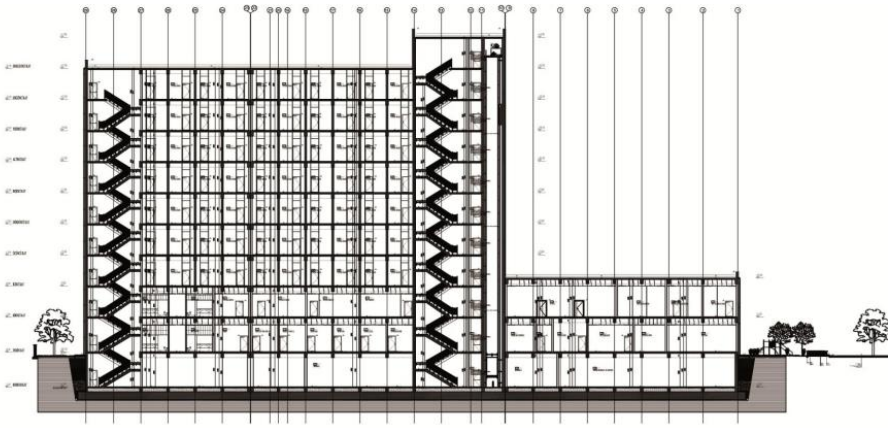


Figure 9. *300-bed teacher's house section, Çelik, 2017*

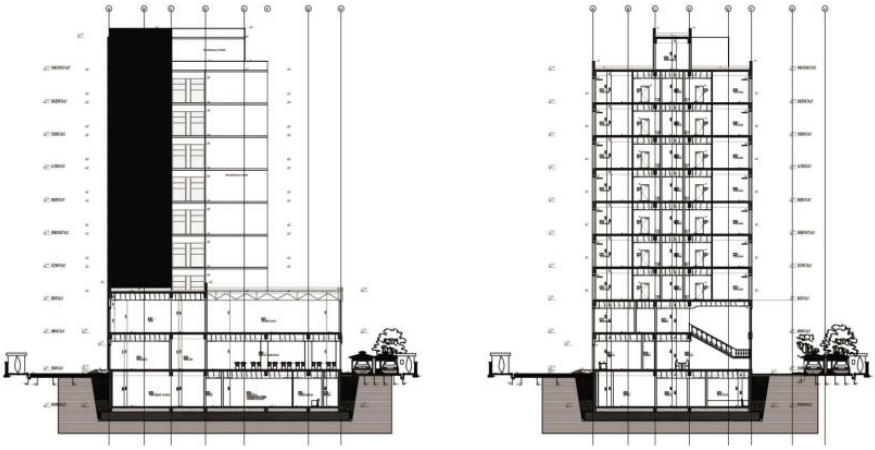


Figure 10. *300-bed teacher's house sections, Çelik, 2017*

The facade of the building was designed as plaster paint considering the economy of the building, and small balconies with stainless steel railings on the bed floors were designed to break the monotony of the mass. The same pattern works as a sunshade on the facade of the dining hall in terms of integrity. The curtain wall is used to emphasize the entrance on the ground floors. The vertical circulation has also been increased as a curtain wall, and the function has been read from the front. The prominence of the building as a prestige structure also affected the facade decisions of the design.

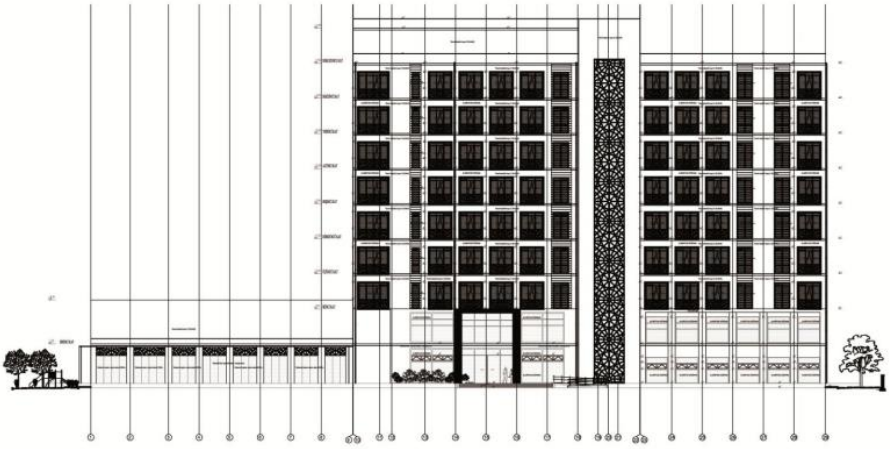


Figure 11. *300-bed teacher's house front view, Çelik, 2017*

Figure 12. *300-bed teacher's house rear facade, Çelik, 2017*

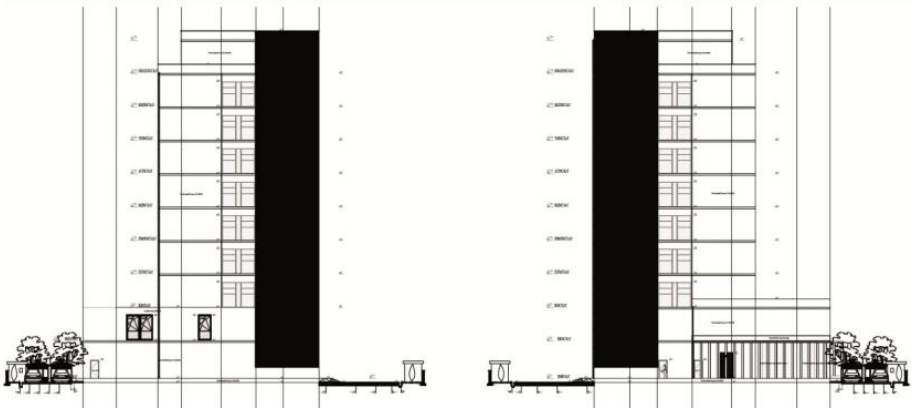


Figure 13. *300-bed teacher's house right and left view, Çelik, 2017*

Three different alternatives (Table 3, Table 4) were requested for the teacher's house project, which was prepared as a typical project. In these alternatives, building seating areas and architectural plans are the same. As a type project, three facade alternatives have been considered in order to provide the best possible solution to different conditions of the project, which will be built in different climates and geographies with different budgets. While architectural and other disciplines (static, mechanical, electrical) application projects, manufacturing and system details and approximate cost calculations were made for alternative-1, architectural projects and approximate cost calculations were delivered for alternatives 2 and 3.

Table 3. *Different alternatives for a 300-bed teacher's house type project*

ALTERNATIVE-1	ALTERNATIVE-2	ALTERNATIVE-3
		

Table 4. *Different alternatives for a 300-bed teacher's house type project*

	LAYOUT PLAN	Perspective	
ALTERNATIVE-1			
ALTERNATIVE-2			
ALTERNATIVE-3			

The interior design was considered during the architectural project stages and was made throughout the stages. At the end of the project delivery, interior visuals for alternative 1 (Figure 14, Figure 15) were prepared.

Figure 14. *300-bed teacher's house interior design, Çelik, 2017*

Figure 15. *300-bed teacher's house interior design, Çelik, 2017*

5. CONCLUSION

This study aims to share the experiences gained during the architectural design and implementation projects of the 300-bed teacher's house type project and to explain the architectural project process. The aim in type project design is that the structures to be implemented in different climate, economic and geographical conditions respond to different conditions at the highest level possible and offer quality alternatives to the users spatially. At the same time, the preservation of the identity and aesthetic values of the buildings is another issue that should be considered.

It is thought that the solution setup developed for horizontal-vertical solutions to the design together with the cooperation and feedback with different disciplines within the architectural design process will provide the emergence of more useful spaces. In a modular design approach, change and transformation can be achieved in the design by adding and removing modules. This adds flexibility to the design. It is thought that the modular design idea and a flexible design provided as a result for type projects are the most correct approach.

In the study, it is aimed that the process experiences and steps given about the public project and design processes will be useful for the public projects to be made from now on. This study, which focuses on the type project stages and the architectural project process of the teacher's house, allows the definition of the needs program and spatial setup for buildings with similar functions and qualities.

Acknowledgement

This study was produced from the 300-bed teacher's house project of the Ministry of National Education, whose architectural design and application projects were made by the author.

REFERENCES

[1] Başaran, İ.E., Türk eğitim sistemi ve okul yönetimi, Ekinoks Yayınevi, Ankara, (2008).

[2] Aydın, M., Çağdaş eğitim denetimi, Gazi Kitabevi, Ankara, (2014).

[3] MEB (2013). Millî Eğitim Bakanlığı Öğretmenevi, Öğretmenevi ve Akşam Sanat Okulu Uygulama Yönergesi http://dhgm.meb.gov.tr/dosyalar/Yonerge/ogretmenevleri_uygulama_yonergesi.pdf, Last Accessed: 01.07.2022

[4] Durmuş, G., "Ortaöğretim eğitim yapılarında 9798 nolu tip projenin mimari özelliklerinin günümüz perspektifinden incelenmesi: Bursa Osmangazi örneği", Master's Thesis, Bursa Uludağ University, Bursa, (2019).

[5] Yavuz Ö. Y., "Çağdaş Konut Örneklerinin Morfolojik Analizi Ve İşlemsel Tasarım Ortamında Üretimine Yönelik Kavramsal Ve Deneysel Bir Model Önerisi", Doctoral Thesis, Gazi University Institute of Science and Technology, Ankara, (2011).

[6] Yıldırım T., "Mimari Tasarımda Biçimlendirme Yaklaşımları ile Bilgisayar Yazılımları İlişkisi", Gazi Üniversitesi Müh. Mim. Fak. Der., Ankara, 19 (1), 66-70, (2004).

[7] Le Corbusier, The Modulor: A Harmonious Measure To The Human Scale Universally Applicable To Architecture And Mechanics, Harvard University Press, Cambridge, (1954).

[8] Ching, F. D. K., Mimarlık, Biçim, Mekan ve Düzen, Yapı Endüstri Merkezi, İstanbul, (2003).

[9] Baldwin, C. Y., Clark K. B., Managing in the age of modularity. Harvard Business Review, (1997).

[10] Schulz, C. N., Intentions in Architecture, Allen and Unwin, London, (1963).

[11] Akın, G., Asya merkezi mekan geleneği (Vol. 1220). Kültür Bakanlığı Yayınları, Ankara, (1990).

[12] Çelik, T., & Karamağaralı, C. N. "An Evaluation of Natural Light Distribution In Spaces With Lighted Dome", Gazi University Journal of Science Part B: Art Humanities Design and Planning, 7(4), 521-532, (2019).