

## USER EVALUATION IN THE DETERMINATION OF QUALITY: BUILDING COMPONENTS IN MASS-HOUSING

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Housing problems of Turkey, and especially those in its metropolitan areas are based on migrations and sudden increases in population. Pressures for new housing, and constraints in the urban land markets brought the need for mass-production into the agenda of the late 70's. In this context, quantitative aspects of the housing problem have been the dominant form of reasoning, in support of the ideas and efforts related to 'mass-housing'. Qualitative and behavioural problems were not in consideration before the 90's. This had adverse effects both on the economy of the country in general, and on the user groups. Several confirmations and warnings about the circumstances have been duly made:

When all of existing supply systems, as squatters and housing in planned areas are considered, sufficient number of houses are produced in quantitative terms; but an agreeable environmental and spatial quality is far from being achieved (Tekeli, 1995, 357-367; author's translation).

Besides a shelter, the house has social, economic, psychological and cultural functions, and provides services to the user not only as a self-contained entity, but in entirety with its immediate environment. It is particularly this aspect of the mass-housing production that comes to the forefront, and justifies emphasis in the quality of the collective design, and intervention in the processes of provision of dwellings and in the shaping of their immediate environment. The special design tools and standards to maintain quality in the mass-housing environment therefore, introduce a most relevant area of study.

The housing provision system in Turkey comprise the squatter-housing, the 'build-and-sell' model, and the housing-cooperative processes. Mass-housing activity is also considered as another alternative form of such provision models. It is claimed that the formal aim of mass-housing is to prevent squatters or other illegal forms of housing, and mostly produced to meet the needs of the low-income groups. Mass-housing in this context is thus simply a method of constructing houses on cheaper land and publicly developed infrastructure provided at cost price (Türel, 1996, 57).

It is a rare occasion that such development is considered an opportunity to maintain total environmental control, and it is a rare achievement that a better quality environment is ever obtained in the mass-housing projects, even though such projects are freely realised under independent administration and formal guidance. This incapacity is mostly due to efforts of lowering the costs in mass-housing, with the excuse of production for the low or middle-income groups. It is often pointed that an acceptable level of quality could neither be maintained at the dwelling units, nor in the communal environment. The issue bears greater significance when such investments are realised with great sacrifices, that could only be made once or twice during the life time for an ordinary middle-income household.

Incentives for housing ownership did generate positive results in Turkey and the building stock grew rapidly. However, all attention given to quantitative growth relative to the previous plan-periods, gave rise to the negligence of quality. For this reason, many of the mass-housing settlements have serious qualitative problems.... It is essential that housing environments be designed to promote the individual, social and cultural enhancement. On the other hand, the quality of the house and its environment can be determined based on criteria measured by normative and numerical values.... The criteria to be developed must have operational relevance at the planning, design, construction, and maintenance stages.... (The 7th. Five-Year Development Plan, Report of Commission of Experts, 1996, 11; author's translation).

Apart from the General Technical Specifications of the Ministry of Public Works and Settlement, no standards are available for the design and production of mass-housing in Turkey. Standards in the Ministerial Specifications on the other hand, either describe construction materials only, or determine the physical dimensions of spaces. This situation reveals the lack of concern and data related to quality of spaces, building components and materials other than the dimensional properties generalised from the construction technology:

As global relations are intensified, there is greater obligation to consider international criteria in issuing standards and regulations for the construction sector. Building performance criteria must be particularly accommodated in regulations, and evaluated with respect to housing construction sector performance standards (the 7th. Five-Year Development Plan, Report of Commission of Experts, 1996, 11; author's translation).

### WHAT IS 'QUALITY'?

The word quality is driven from 'Qualis' in Latin, which questions the action 'how to form'. Whatever product or service it is used to describe, it implies the 'real nature' of that product. The dictionaries have many definitions of 'quality':

Quality means, freedom from deficiencies; freedom from errors that is required during work ... or from customer dissatisfaction, customer claims ... Quality means, those features of products which meet customer needs and thereby provide customer satisfaction (Juran and Godfrey, 1999, 1.1-5.1).

According to a widely accepted view, quality is 'customer satisfaction' or 'fitness for use'. The measurements made for determining the fitness of the final product to the standards envisaged, aims to provide an evaluation of that product. However, the quality level of a product is determined during its process of production. Measurements made 'after' the production process may therefore bear little or no affect on the actual quality level of that product. The quality description of the final product could only provide input to other production processes to follow and subsequent products. To attain quality, it is necessary to begin with establishing the 'vision' of the agents of production, along with their policies and goals.

Conversion of goals into a result is achieved through managerial processes, a sequence of activities that produce the intended results. Quality management in production is carried out employing three complementary managerial processes of 'planning, control and improvement', known as the 'Juran trilogy'.

**Quality Planning:**

This is the activity of developing products and processes required to meet customers' (users') needs. It involves a series of universal steps which can be summarized as follows:

1. Establish quality goals (project goals, measurement of the goals in terms of quality, quantity, cost, and time);
2. Identify the customers (external customers as users and speculators, and internal customers as designers, contractors, suppliers, financiers, etc.);
3. Determine the customers' needs (priorities and perceived needs, cultural needs, unintended use, ergonomic requirements, physical comfort, psychological, human safety, aesthetic factors, facility in repairs and recovery of deficiencies, etc.);
4. Develop product features that respond to customers' needs (Product Development: standards, regulations, criteria for design, optimizing building features and goals, costs; Design Process: planning, schematic design, design phases, production, use; Control);
5. Develop processes that are able to produce these required features;
6. Establish control processes, and transfer the resulting plans to the operating producers;

**Quality Control:**

Quality control can be maintained in three phases:

1. Evaluate actual quality performance;
2. Compare actual performance to quality goals;
3. Act on the difference.

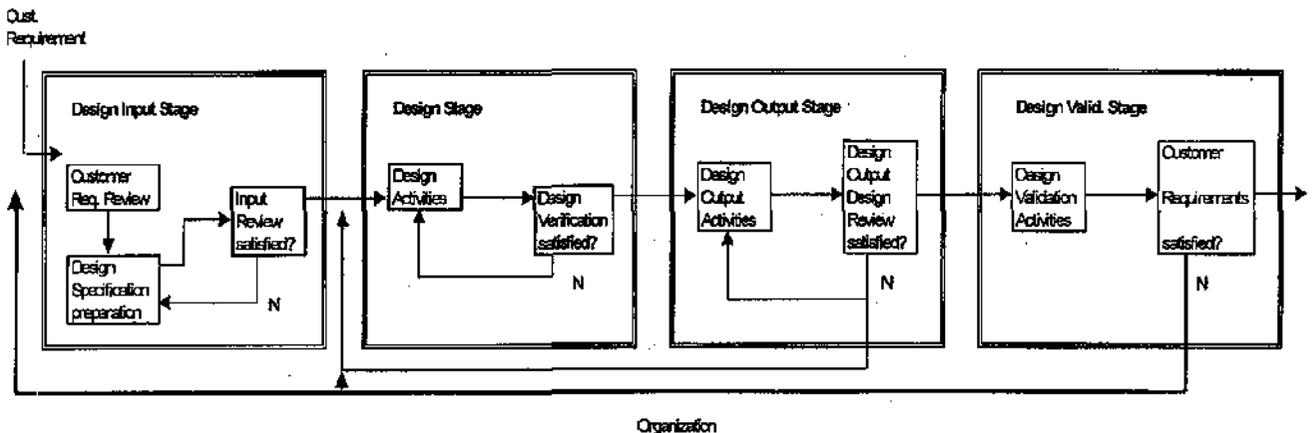
**Quality Improvement:**

This process is the means of raising quality performance to unprecedented levels. In the case of housing:

The owner-occupiers ought to take part in controlling the building to achieve the necessary quality, within the framework of powers and responsibilities he/she is given ... (The 7th. Five-Year Development Plan, Report of Commission of Experts, 1996, 174; author's translation).

More relevant is the issue of safeguarding the quality in the name of some common interest or the 'public benefit', and not necessarily for the interest of individuals. This is a 'must' in the design of mass-housing environments where design work is to serve for some unanimous user. In this context, the determination of the user profile during the planning and design stages is of utmost relevance.

Figure 1. Ideal ISO 9001 Process expanded view (Schoonmaker, 1997, 23).



1. ISO9000 is not a standard, but a generic term applied to a series of standards and accompanying guidelines. 'ISO' is a French acronym for the International Organisation for Standardization. It is a quality governance system which can be used both to compose a quality system, and to evaluate an existing one. ISO9001 give the conditions to be realized by organisations responsible from design, improvement, production and/or assemblance and giving such services.

The idea that quality means meeting customer requirements alone therefore, is not sufficient. Quality should mean meeting the customer's requirements the first time the customer interacts with the product. The process shown in Figure 1 indicates the effort of realizing this state.

Obviously, there are other activities within any organization that seek to satisfy the customer needs. But efforts are likely to fail if the end-product is not capable of attaining customer satisfaction. Beginning with the stage called 'Design Validation', then, the activities within the stages of the ideal process are expanded by ISO9001. Improvement of standards like ISO9000 series is within the concern of the construction sector, and in particular the quality planning and/or design of housing (1). Although the composition of such standards are often design-dependent and are based upon data obtained from occupants of mass-housing, these should be evaluated on the basis of some 'fixed' or 'minimum' cost principle.

### QUALITY MEASUREMENT

Decisions are no better than data on which they are based. An essential activity within the feedback loop is the collection and analysis of data. This activity falls within the scientific discipline known as statistics. Planning for quality control has to maintain an information base which can serve for all decision-makers. Main steps of maintaining this system are:

1. Selection of the 'critical few' measurements;
2. 'Analysis' (defined as separating or breaking up of any whole into its parts so as to find out their properties, functions, relationship *etc.*);
3. 'Synthesis' (formulation of the results and their presentation);
4. Recommendations for a specific decision.

The most crucial issues in this process are the 'data quality' and 'measurement consistency'. Measurement can be objective and/or subjective (*ie.* opinions). The virtues of objective measurement are often praised in texts on management and statistics. In the case of 'opinions', credits are given to those made on a nominal scale of 'Yes/No' variety, since opinions are considered imprecise and subject to change.

Despite the disadvantages, subjective measurements have certain superiorities that should not be dismissed. The customer/user opinion is the final arbiter in quality management. Yet there are always inherent requirements that customers could not clearly state in objective terms. Furthermore, the user is the only person whose awareness of the deficiencies in his/her dwelling bears any significance.

### QUALITY CRITERIA OF BUILDINGS

The evaluation of houses by their occupants in spatial, physical, visual and socio-cultural terms mostly rely on qualitative criteria. Information for design, generated by mass-housing occupants would be qualitative in essence. These are usually based on 'visual contentment and social interaction criteria', on 'physical criteria and climatic comfort conditions'. A classification of quality criteria for this context is given below, and the details in Figure 2.

1. Physical Criteria;
2. Visual Criteria;
3. Social Communication Criteria;
4. Psychological Criteria;
5. Economic Criteria.

Based on the criteria extracted from related literature, several analyses in mass-housing areas were carried out and 'performance quality' of housing were measured. Propositions were thus based on these measurements.

Figure 2. Quality criteria for housing evaluation according to various sources.

<b>1. Physical Criteria (Dülgeroğlu, et. al., 1996)</b>	
<i>Physical Control Parameters</i>	<i>Perceptual Variables</i>
Climate	Visual
Temperature	Thermal sense
Humidity	Spaciousness
Radiation	Auditive
Air Motion	Tranquillity
Light	Feasibility
Illumination Level	Uneasiness
Reflectivity	Dimensional
Noise	Social status
Voice Level	Functional
Reverberation Level	
Frequency	
Dimension	
Width	
Length	

<b>2. Visual Criteria (Dülgeroğlu, et. al., 1996)</b>		
Colour	Unity	Privacy
Tissue	Visual balance	Complexity
Form	Contrast	Integrity
	Harmony	Interaction
	Row order	Territorial Properties
		Efficacy

<b>3. Social Communication Criteria (Dülgeroğlu, et. al., 1996)</b>	
<i>Social Interaction Criteria</i>	<i>Percepted (subjective) Variables</i>
Objective Variable	Privacy
Intimate	Crowdedness
Personal	Interaction
Social	Territorial
Public	Efficacy
Homogeneity	
Neighbourhood	

<b>4. Psychological Criteria (Imamoğlu, 1995)</b>	
Harmony / inharmonious	Sense of loneliness
Sense of freedom	Sense of privacy
Sense of security	Separation/ Feeling of integrity

<b>5. Economic Criteria (Bayazit, et. al., 1992)</b>	
Building geometry	Periphery area
Gross dwelling area	Number of dwellings
Living area	Clear internal height
Suitable area	Circulation area etc.

**USER QUALITY EVALUATION RESEARCH IN ERYAMAN IVth. PHASE MASS-HOUSING DISTRICT**

The Eryaman Fourth Phase Mass-Housing District in Ankara was chosen as a pilot area in the research project, designed and carried out by the author. The choice of the survey area was based on a number of issues that were theoretically and practically relevant and that allowed comparative analyses.

**The Choice:**

The status of the area as a mass-housing district;  
 The purposes of targeting the lower and middle income groups;  
 The use of different construction technologies as the basis of building groups;  
 Existence of different designers and designs;  
 Existence of different contractors in production;  
 Existence of sufficient number of cases to reach at conclusions;  
 Availability of the projects from Housing Administration;  
 Ease of transportation.

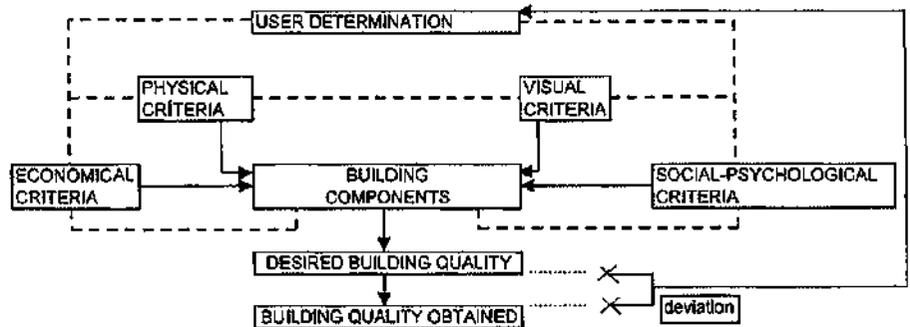
**The District:**

The planning and construction activities in the Eryaman Mass-Housing District was initiated with the transfer of 1100 hectares of vacant land to the Prime Ministry Housing Administration after its expropriation. A large housing layout with 42000 dwelling units was planned, and 15153 dwellings were designed and constructed in four stages. Starting in 1994, these progressed in phases that comprised 4740, 3180, 3195 and 4038 units in each step. The project was planned for the housing of middle and lower-income groups, providing a distinct opportunity for these groups in owner-occupation. The Eryaman Housing Project then became a stereotype in the provision of housing.

Figure 3. Housing Zones, Designers, and Constructors in the Eryaman Mass-Housing, as in Figure 4.

**The Variety:**

In the 'Eryaman Mass-Housing Fourth Phase Houses District', 3195 dwellings were built with 55 different types of buildings in 8 zones.

**Aim of Research:**

Most of research on mass-housing evaluation concentrate on issues concerning overall layouts and exterior spaces. In the building-component researches in mass-housing settlements however, the aim is usually to detect the defects of the project, workmanship, choice of materials, and user faults. This study was focused on the occupants' direct evaluation of their dwellings and the performance of its components in use. The aim of the study was to compile data for the control and design processes relevant for the producer organisation of mass-housing. This was carried out with the assumption that such information could enable housing producers follow user needs and meet their expectations.

**The Scope and Method of Research:**

An interview was carried out with the occupants of the Fourth District, to capture their opinions on the building components. Building components are the primary determinants of the spaces created and used, subject to direct user assessment. In the process beginning with contracts drawn prior to the design phase, extending to the design and construction phases, and obtaining of the final product, building components are the perfect tools to monitor the process. A process starting with the choice of 'building components', would introduce a 'correct' construction process to follow the user expectations and needs. Only this approach could maintain the correct choice of building materials, the necessary level of workmanship and the intended overall quality.



Figure 4. Eryaman Mass-Housing Fourth District, and construction zones layout.

The 'building components' are the elements that users are in direct functional or visual relation. Such elements are defined as the 'upper components' for the purpose of the research and comprise the Walls, Floors, Ceilings, Windows, Entrance Doors, and Room Doors. The building components investigation covers aspects of finishings and the problems faced during use. The structure and implementation of the components approach and its results are presented in the following sections and in Figure 5

Figure 5. Quality Determination Criteria for Mass-Housing Buildings.

Zone	Designer	Contractor	Constr. Tech.	Storeys Above
				Ground Level
B1	Doruk PAMİR	Öztaş AŞ.	TM	6
B2	Oral VURAL	Soyak AŞ.	TM	7
B3	Ziya TANALI	STFA/ALFA	TM	6
B4	Doruk PAMİR	Yardımcı AŞ.	TM	6
B5	Erkut ŞAHİNBAŞ	Yüksel İnş. AŞ.	TM	6
B6	Ziya TANALI	Klima AŞ.	TM	5,6,7
B7	Oral VURAL	Hazinedaroğlu AŞ.	TM	7
B8	Ragıp BULUÇ	Klima AŞ.	RCF	4,6,7

#### THE QUESTIONNAIRE

The inquiry contains a set of initial questions that help reveal the profile of users. This covers the number of individuals in the user family, the income group, level of education, and status in tenancy. A second set of questions determine the location of the dwelling to indicate the zone number, location in the building, etc. The variables in the main body of the questionnaire are given in Figure 6. The building zone type implying different plan type, and the floor level of the dwelling were taken as the basis in the choice of samples and evaluation.

Organization of the variables:

'Category' type variables are introduced so as to cover all the response alternatives that could be given. An 'others' option was also provided for the unexpected and unqualified conditions stemming from the design and construction of building components. 'Dummy' variables (Dichotomous) are presented to the users as close ended questions (Yes/No, or 1/0). Questions not answered were not taken into consideration.

A.	B.	C.	D.
<b>BUILDING COMPONENT</b>	<b>PROBLEMS IN USE</b>	<b>SPACES</b>	<b>FINISHING MATERIAL</b>
1. Walls	1. Sound transfer	1. Entrance	1. Paint
2. Floors	2. Heat transfer	2. Living hall	2. Wall paper
3. Ceilings	3. Cleanliness and ease in maintenance	3. Bedrooms	3. Timber panel
4. Windows	4. Ease of repair	4. Kitchen	4. Ceramic tile
5. Exterior door		5. Bathroom	5. Others
6. Interior doors		6. Balcony	
E.	F.	G.	H.
<b>GENERAL COMPLAINTS</b>	<b>COMPLAINTS ON INTERIOR WALL SURFACES</b>	<b>COMPLAINTS ON INTERIOR WALL SURFACES</b>	<b>PEELING OF INTERIOR WALL SURFACES</b>
1. Yes	1. Yes	1. Cracks	1. Paint
2. No	2. No	2. Condensation	2. Wall paper
		3. Moldiness	3. Timber panel
		4. Change of colour	4. Ceramic tile
			5. Others

Figure 6. The questionnaire variables.

#### Method of Implementation:

The questionnaire findings were tabled by means of the Microsoft Excel program as the base-data. In this process, inquiry numbers were used as the 'key' to bind the building components with each other. Statistical analyses were carried out with the SPSS program, employing the 'cross-tabs' and 'bivariate correlation' routines. Both high and low coefficients were taken into consideration whenever meaningful relations were found.

The only disadvantage of the sample area for the research purposes was its recent occupation and the short use experience extending only for one year. This causes a bias due to the fact that deformations in some of the components and materials have not appeared yet. However, when observed from another perspective, this situation increases the significance of the negative results, and thus the effectiveness of data as input to the construction and design phases of other project and implementation processes.

### FINDINGS AND PRELIMINARY EVALUATIONS

According to the findings of the survey, occupants of the area are in general, middle and low income group households, 60.3 % of which are owner-occupiers. The tenants are also of similar households in terms of incomes. However, since the ratio of tenants is significantly high (higher than city and national averages) it remains to question whether the owners of the rented dwellings are not higher income households, in order to conclude that the housing project authentically served to lower income groups. Another distinctive finding related to income levels is the fact that most of the relatively higher income households seem to have preferably accommodated themselves on the ground floor. Other preliminary findings of significant nature and particularly related to the building components are given below:

'Tunnel moulding' employed by most of the producers obviously has significant cost minimizing effects in terms of reducing construction periods. The rationalised and repeated use of steel moulds and concrete prepared in higher standards are concomitants of this process. All of these factors lead to economies to be obtained by mass-housing, and are in conformity with the essence of mass-production. However, this is often achieved at the expense of design quality and a sufficient level of variety in the physical environment. The latter is a serious necessity in meeting the rich variety of human demands, and physical and psychological needs. Especially the design of projecting and recessing block types, and the provision of different types of dwellings in one block of flats are inhibited by the use of 'tunnel moulding'. Such capacities in design variety is drastically lost in employing 'tunnel moulding' and the result is low quality in the design of spaces.

When production quality is considered, it is observed that in most of the houses, early building damages do exist. This is largely dependent on the low quality of finishing materials used, and their sloppy application that one would expect to have been minimized in the context of mass-housing. The results obtained from the 'wall components' for instance reveal differences between the flats. When flat interiors are considered, condensation and mouldiness seem to be dense on the ground floors. There can be two different sources of condensation and mouldiness on the interior surfaces of peripheral walls. One cause of dampness could be capillary action through the absorption of ground water if the insulation is not properly made. Secondly, the tunnel moulding system providing exposed concrete walls, are not sufficiently insulated in their interiors, resulting again in capillary motions with the absorption of rain and snow from the atmosphere. This results in the condensation and wetting of the walls even if some insulation layers exist in the composition of the exterior walls.

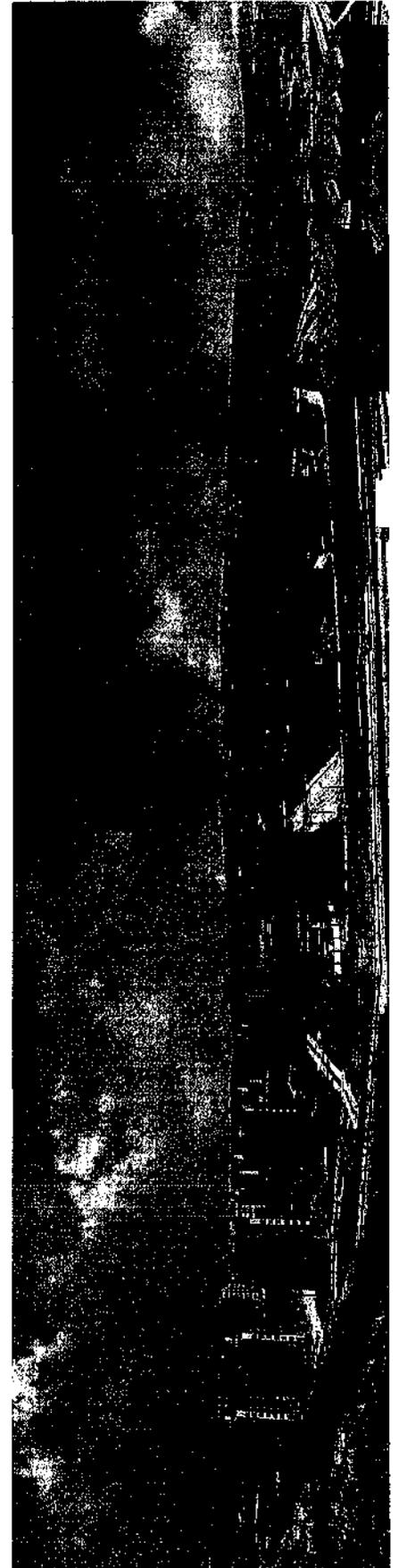
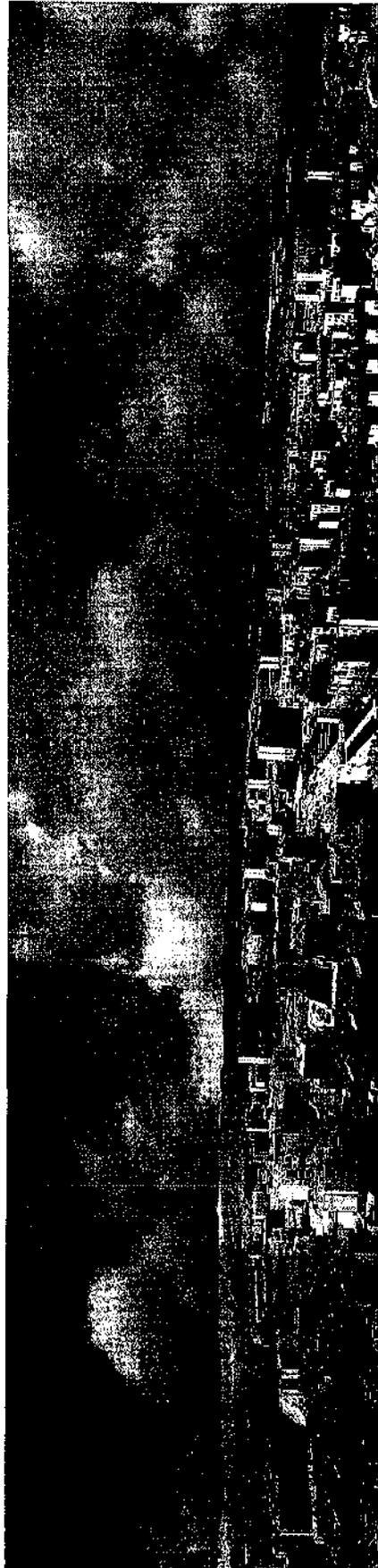


Figure 7. Panoramic Views from Eryaman  
4th Stage Mass-Housing Area in Ankara.

The damp walls in the bathrooms, especially in the zone B2, result from improper wall-papering. Some dwelling owners who changed the papers with ceramic tiles claim that the problem ceased with this change. No colour differences are observed on the walls, but this may be due to the short period of use. Furthermore, it is highly likely that cracks and mouldiness on the interior surfaces of the peripheral walls cannot be observed because of the wall-papering.

As walls are largely load-bearing concrete mass components, nailing objects on walls becomes impossible. This problem arises from the insulation layer applied on the interior surfaces of the peripheral walls. If such action is necessary on the exterior, crumbling occurs. Thus the material chosen directly shapes problems in user experiences.

Users especially in the B8 region have stated that, the energy outlets on the walls are insufficient in the kitchens and bathrooms. Generally, one-third of the users require a TV outlet in the kitchen. Another major design problem observed and recorded in the statements of the occupants is the disapproval of the relation between the entrances and the living-halls. Such complaints seem to concentrate especially in zones B3 and B6.

In relation to floors, cracks cannot be seen due to carpets covering them and hiding the problems. But, it is recorded that the carpets at some places have swollen up. Crumbling is observed to occur on the ceiling paint at the upper levels. This is often due to the terrace-flats above. Traces of mouldiness were clear on the ceilings in zones B7 and B8.

Since the 'tunnel moulding' system is monolithic due to the continuous moulding of the walls and ceilings together, sound transfer capacity of the walls and ceilings are very high. Many complain from the uncontrollable noise levels, as any stroke on the floors are reflected on the walls aggravating the level of noise. Complaints about the sound transfer property of the floors seem to focus more in the living-halls and bathrooms and less perhaps in the bedrooms. This is related to the specialized activities of the spaces itself. The sound transfer in the bathrooms are related to the construction technique, and accentuated by the use of suspended ceilings.

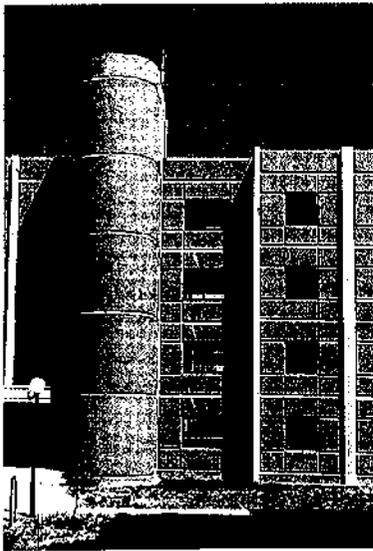
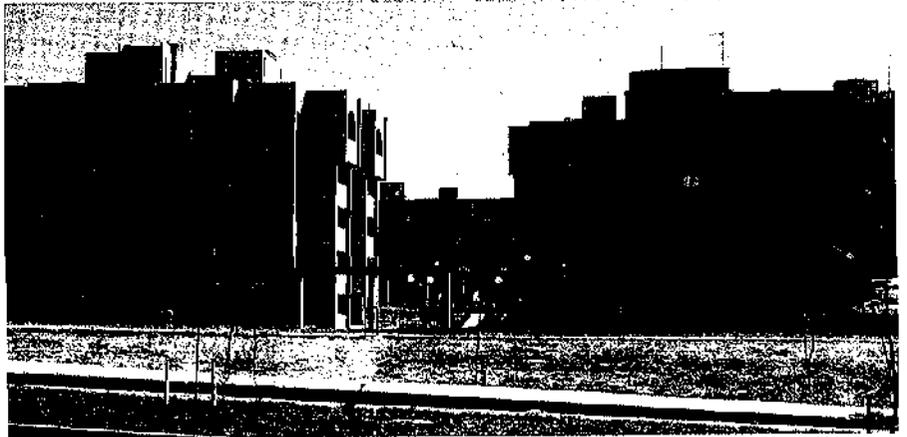
The use of aluminium windows seems to increase the complaints of water and air seepage. In zones B6, B4, and B1 complaints of cracks and deformation in windows are frequent. Another category of complaints are on the dimensions of windows. There are dwelling types where the living-hall window dimensions are insufficient to allow the day light in. Iron bars are often adopted at the ground floor, due to occupants' concern of low security precautions, which in turn further reduces the daylight availability at the darkest part of the blocks.

Complaints concerning the heat and cold transfer from the walls, from the floors on ground floors, and from the ceiling of upper floors, are notable. Some 60% of the households indicate that there is intolerable cold air filtering from the doors. These complaints increase again on the ground floors.

On the issue of maintenance of dwellings, it has been stated that wall-papers constitute a general source difficulties. Carpet floor finishing in the living-rooms and bed-rooms are equally obstructive in achieving the desired mode of cleanliness. Cleaning difficulties are expressed again in cases where living rooms with large windows, and short of means of external access like a balcony prevail.

In all of the zones, the common complaint has been the insufficient number of bathrooms and WCs, only one being provided in each dwelling.

Figure 8 and 9. Exteriors of zone B1, Eryaman 4th Stage Mass-Housing Area in Ankara.



### CONCLUSION

A preliminary review of the findings on user assessment of the housing environment in Eryaman reveals a sufficiently rich variety of issues that could be employed as useful feed-back information in revising the design and production processes in mass-housing. Much needs to be investigated however, in this field of housing provision, since substantial monitoring is possible through the refined regulation of building components.

On the other hand, owning a house is one of the life-time expectations for most of the households. Once achieved, it is almost irreticvable to alter the investments and choices they made. Great sacrifices could thus turn into gross dissapointments for many. It is vital therefore, that quality performance of housing should be closely scrutinized by some active controlling organization, and perhaps providing quality certificates to meet the much needed consumer protection practices in housing.

## TOPLU KONUT YAPI BİLEŞENLERİNİN KALİTE BELİRLEMESİNDE KULLANICI DEĞERLENDİRMESİ

### ÖZET

Alındı : 24. 10. 1999  
 Anahtar Sözcükler: Toplu Konut, Çevre Kalitesi, Eryaman Toplu Konut Alanı Projesi, Sosyal Konut, Çevre Değerlendirme Yöntemi, Konut Değerlendirme, Yapı Kalitesi, Yapı Performansı, Yapı Bileşenleri.

Alt ve orta gelir grubunun konut ihtiyacını karşılamada 1970'li yıllarda üretilen toplu konutlar yoluyla sayısal olarak artışlar sağlanmışsa da, 1990'lı yıllarda bu türden konutlarda oturan kullanıcı gruplar açısından, önemli bakım-onarım güçlükleri ve maliyet artışları ortaya çıkmıştır. Bunlara koşut olarak, kalitatif yaklaşımlar ve araştırmalar önem kazanmıştır. Yedinci Beş Yıllık Kalkınma Planı İhtisas Komisyonları Raporları'nda da belirtildiği gibi, toplu konutlarda kalitenin sağlanabilmesi için planlama, tasarım, yapım, bakım ve onarım evrelerinde kullanılacak teknik şartnamelere gereksinim vardır. Çünkü, Türkiye'de Bayındırlık Bakanlığı 'Teknik Şartnameleri'nin dışında genel teknik bir şartname bulunmamaktadır.

Kalite (Qualites) Latince 'nasıl oluştuğu'nu sorma anlamına gelen 'qualis' kelimesinden türemiştir. Kalitenin pek çok tanımı yapılmaktadır. Kısaca 'müşterinin memnuniyeti', ya da 'kullanıma ve gereksinime uygunluk' olarak tanımlanabilir. Dolayısıyla yapının gereksinimlere uygunluğunun sağlanmasında ve yapının elde edilme evrelerinin tümünde, 'kalite yönetimi' uygulamak gerekmektedir. Kalite uygulaması süreci, 'Kalite Planlama, Kalite Kontrol, Kalite Gelişimi' olmak üzere üç temel kalite yönetim aşamasını gerektirir. Müşteri ya da kullanıcı, sonuç ürün olan konut yapısı ile kullanım aşamasının ne kadar öncesinde ilişkilendirilirse, sonuç ürün o kadar 'uygun' ya da başarılı olacaktır. ISO 9000 kalite uygulamasında da belirtildiği gibi, bu süreç tasarım evresinin alt evre bileşenlerinde gerçekleştirilebilir. Kullanıcının öznel gereksinimleri toplu konut gibi kullanıcısının önceden belirlenmediği süreçlerde sorun olmaktadır. Diğer bir deyişle, kalite yönetim evrelerini uygulayabilmek için, kalitenin ölçülebilir olması gerekmektedir. Bu bağlamda, istatistik yöntemlerle elde edilen kullanıcı kalite değerlendirmeleri yeni üretim süreçlerine de girdi verecektir. Ancak, diğer süreç kararlarının 'doğru' olabilmesi için, bu veri girdilerinin de 'doğru' olması gerekir. Konut çevreleri için geliştirilmiş bir dizi kalite ölçütü ve ölçüt alanı bulunduğu literatürde izlenmektedir.

Gazi Üniversitesi Araştırma Fonu tarafından desteklenen 'Eryaman IV. Etap Toplu Konutlarında Yapı Bileşenlerine Yönelik Kalite Değerlendirmesi Araştırma Projesi' Ocak 1997'de başlayıp, Mayıs 1998'de tamamlanmıştır. Örnek alan, 8 bölgede 55 ayrı plan tipinde 3195 konut içermektedir. Alanın yalnızca bir bölgesi (B8 Bölgesi) dışında kalan tüm bölgelerde, yapı üretiminde 'tünel kalıp teknolojisi' kullanılmıştır. Araştırma konusu olan yapı bileşenleri ise, kullanıcının doğrudan ilişkide olduğu (gördüğü, kullandığı vb.) elemanlar olarak belirlenmiştir. Bunlar, yapı bileşenleri, genel kullanım sorunları, mekanlar, bitiş malzemeleri, genel şikayetler, dış duvar yüzeylerinde gözlenenlere dayalı yakınmalar ve benzeridir.

Araştırma sonucu elde edilen bulgular ve değerlendirmelere göre, tünel kalıp teknolojisinin uygun kullanılmaması, düşük kaliteli malzemenin kullanılması, üretim kalitesinin düşüklüğü, yanlış malzeme seçimi, mimari tasarım hataları, yapılmaması başlıca yetersizlikler olarak özetlenebilir. Seçilen örnek alanın tek dezavantajı, konutların yalnızca bir yıldır kullanılmakta oluşu nedeniyle, zamana bağlı deformasyonların yeterince ortaya çıkmamış olmasıdır. Ancak bu durum, elde edilen olumsuz bulguların etkinlik derecesini daha çok artırmaktadır.

Konutta tüketici koruma amaçlı kurumlaşmaların giderek daha büyük bir gereksinime olduğu görülen ülkemizde, kalite göstergelerine dayalı değerlendirmeler de toplumda önemli bir yer tutmak üzere yaygınlaştırılmak zorundadır.

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