BUILDING INSPECTION IN TURKEY

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ABSTRACT

BUILDING INSPECTION IN TURKEY

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Turkey has lived an awakening after the earthquakes of 17 August 1996 in Marmara and 12 November 1999 in Düzce. Turkey has paid the cost of a delayed awakening with the loss of approximately 45,000 citizens and 20 billion dollars. Turkey, which is located on active seismic fault lines, has previously encountered such destructive earthquakes but necessary measures have not been taken due to the previous earthquakes not striking the large metropolis and industrial zones, lower losses in terms of lives and property, and lack of interest of the media in terms of the issue. The importance and necessity of building inspection could only be realized after said disaster. Subsequently, the Ministry has worked like a factory producing laws, regulations and decrees having the force of law and has implemented numerous practices in a rush. Said practices containing the post-earthquake haste and reactive approaches are currently still

being discussed and could only be regulated within a period of 2-3 years. This study will examine the building inspection system, which has been applied in Turkey prior to the earthquakes of 1999, which are considered as a sad turning point, and the laws and applications related with thereof. Subsequently, the building inspection practices of certain countries, unions and international legislations will be discussed in order to provide for examination and comparison of the laws, regulations and practices, enacted by the Ministry after 1999, at international level. The study will be concluded with the examination of the building inspection systems recommended after the year 1999, study of the inefficient aspects and recommendation of specific solutions.

Key Words: Building Inspection, Turkish Improvement and Inspection Legislations

ÖZ

TÜRKİYE'DE YAPI DENETİMİ

HACIBALOĞLU, Dinçer
Yüksek Lisans, İnşaat Mühendisliği Bölümü
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17 Ağustos 1999 Marmara ve 12 Kasım 1999 Düzce depremlerinden sonra Türkiye'de bir uyanış dönemi başlamıştır. Geç kalmış bu uyanışın bedelini Türkiye yaklaşık 45.000 kadar vatandaşını ve 20 milyar dolarını kaybederek ödemiştir. Zaten aktif deprem fay hatları üzerinde bulunan Türkiye böylesine yıkıcı depremleri yaşamış ama önceki depremlerin büyük metropoller ve sanayi bölgelerinde olmaması, can ve mal kaybının az olması, medyanın da konuya ilgisiz kalması nedeniyle gerekli tedbirleri almakta geç kalmıştır. Yapı denetiminin önemi ve gereği ancak yaşanan bu felaketten sonra ilgililerin aklına gelebilmiştir. Bundan sonra ise bakanlık tam bir kanun, yönetmelik ve kanun hükmünde kararnameler fabrikası gibi çalışarak alelacele bir çok uygulamayı yürürlüğe sokmuştur. Deprem sonrası telaş ve tepkisel yaklaşımlar içeren bu uygulamalar, hala tartışılmakla birlikte ancak 2-3 sene sonra bir düzene oturmaya başlamıştır. Bu çalışmada öncelikle acı bir dönüm noktası olarak görülen 1999 yılı depremlerinden önce Türkiye'de uygulanan yapı denetim sistemi ve bununla ilgili kanunlar ve uygulamalar incelenecektir. Daha sonra,

1999 yılından sonra Bakanlıkça çıkarılan kanun, yönetmelik ve diğer uygulamaların evrensel bir boyutta incelenebilmesi ve karşılaştırmaların yapılabilmesi için bazı ülkelerin, birliklerin uluslar arası mevzuatların yapı denetim sistemleri incelenecektir. 1999 yılından sonra önerilen yapı denetim sistemlerinin incelenmesi, aksayan yönlerinin irdelenmesi ve bazı çözüm önerilerinin getirilmesi ile çalışma son bulacaktır.

Anahtar Kelimeler: Yapı Denetimi, Türk İmar ve Denetim Uygulamaları

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LIST OF ABBREVIATIONS

BC	Before Christ
DASK	Doğal Afet Sigortaları Kurumu
DIN	Deutsches Institut für Normung
EU	European Union
FIDIC	Fédération Internationale des Ingénieurs - Conseils
İGSAŞ	İstanbul Gübre Sanayi Anonim Şirketi
INTES	Türkiye İnşaat ve Tesisat Müteahhitleri İşveren Sendikası
KHK	Decree Having the Force of Law
MARC	Moyen Administratif Pour la Réassurance de la Construction
NHBC	National House-Building Council
OIA	Organized Industry Area
PE	Professional Engineer
PETKİM	Petrokimya Holding Anonim Şirketi
PIC	Project Inspection Consultant
SECO	Bureaude Controle Pour la Securite de la Construction
SIS	Small Industry Site
SOCOTEC	Société de Controle Technique
TMMOB	Türk Mühendis ve Mimar Odaları Birliği
TOBB	Türkiye Ticaret , Sanayi, Deniz Ticaret Odaları ve Ticaret Borsaları Birliği
TS	Turkish Standards
TSE	Türk Standartları Entitüsü
TUVASAŞ	Türkiye Vagon Sanayi Anonim Şirketi

TÜPRAŞ	Türkiye Petrol Rafinerileri Anonim Şirketi
TZDK	Türkiye Zirai Donatım Kurumu
UBC	Uniform Building Code
UK	United Kingdom
USA	United States of America

CHAPTER 1

INTRODUCTION

Since existence, sheltering is a fact needed by humankind. With the exact expression, a place to live has turned into modern structures in this time as it were caves in ancient times. However, during this period expectations of man from their places to live have passed beyond only sheltering. Evolution of humankind and alterations in consuming habits related to this progress showed itself as an orientation to buildings of good quality. Because of this intention, people regarded the places they live, as not only a space to shelter but also places offering a certain comfort of use with both physical and physiological ease.

It is one of the main duties of governments to assure the inhabitance of people in safe, healthy places of satisfying their expectations. With the purpose of fulfilling this task, since ancient history governments developed various rules and established many intuitions. In Ancient Rome and Greece similar applications, which protect the building owner against defects and faults during construction, that first started with Hammurabi 18. Century B.C. with principal "an eye for an eye", are encountered. In the course of time, new laws and regulations are developed about planning, designing, constructing and inspecting with changing structures of governments in parallel with technologic, sociologic and cultural evolution of societies.

In consequence of many battles with various obstacles of history, today expectations from a place of living in Turkey are not much even changing rapidly. Even if this situation has many causes, at this point it is the impacts on Turkish construction industry upon which shall be dwelled. During Ottoman Empire, a few regulations about construction and improvement were put into force only after earthquakes and fires. To be studied in detail in following chapters, social-politic variations since Republic in Turkey and the things made or not made have led us to the view becoming evident because of earthquakes in 1999.

Starting with 1998 Adana-Ceyhan, then 1999 Marmara and Düzce earthquakes, fact of earthquakes has started to take place in the agenda frequently. The difference of these three earthquakes is that they happened at or near metropolises and industrial zones. This difference has especially been observed by comparing the attitude of big media organizations towards other earthquakes and these earthquakes. Dinar and Erzincan earthquakes, having been evaded as if they had not happened by media organizations, have been forgot in 1-2 months after news dealt with sentimentality supported by opinions of a few experts without attaching importance. Nevertheless, it is obvious that as the epicenter of earthquakes got close to metropolises and to areas where industrial organizations and media have intensified, criterions of evaluations have altered significantly. As the outcomes of previous earthquakes were evaded as if they were not due to deficiencies in building inspection, improvement, local governments, bidding laws and engineering services; in this case the situation has been tried to be kept on the agenda by its different sides. The change of attitude after such destruction is as much pleasing as it is sad.

According to the statistics, earthquakes in Turkey cause more destruction and loss of life than similar earthquakes of equivalent magnitude in different countries. In fact, the realities behind this scene will be explained in detail in

following chapters. However briefly, upon recent time most of the buildings were being built without any legal or technical inspection. Consequently, Turkish people keep on living in buildings of poor quality despite many experiences in past.

Indeed, it shall be more realistic if a citation is made from official web site of State Planning Organization to describe the damages of 1999 to Turkey:

"*As the impacts of earthquake like loss of building, machinery-equipment, product and half-product and decrease in skilled and unskilled workmanship in production industry workshops appear, meantime influences in form of loss in production resulting from discontinuity of production in industrial plants and possible decrease in export for such organizations are in question. It is being estimated that total value added loss of production industry plants in the region is around 600-700 million dollars and in consequence of these it is being anticipated that annual growth of Turkish production industry to decrease in the level of 1.6 points. The most significant and irrecoverable impact of earthquake on production industry plants is loss in skilled workmanship. For the purpose of compensating the damages of public organizations showing activity in production industry, it is compulsory to invest 115 million dollars for TUPRAŞ plants, 80 million dollars for TUVASAŞ, 20 million dollars for İGSAŞ, 6.5 million dollars for PETKIM, 0.6 million dollars for TZDK; summing up approximately 222.1 million dollars. As production in plants owned by public organizations like TÜPRAŞ, TÜVASAŞ, İGSAŞ, PETKİM, TZDK was ceased due to damages caused by earthquake, production in plants like SEKA- İzmit Plants, Asil Çelik were stopped because of damage in infrastructure and loss of workmanship. It is being estimated that loss of production or sale in these organizations are 558.6 million dollars for TÜPRAŞ, 20 million dollars for TÜVASAŞ, 18.6 million dollars for İGSAŞ and 34.3 million dollars for PETKİM totally 631.5 million dollars. It is also being reckoned that 2 trillion Turkish liras is required for compensating the damages in six Organized Industry Area (OIA)*

and 30 Small Industry Sites (SIS) under service; 9 OIAs and 13 SISs under construction.

It is being anticipated that loss of skilled labor is extremely high since earthquake region is the most important industry zone of our country. Due to loss of workmanship and motivation depending on the disasters, some organizations have temporarily ceased the production. There are families who lost their income sources owing to death, injury and disability caused by earthquake."

In this study, the historical background of building inspection in world and Turkey will be outlined in Chapter 2. In this chapter, a detailed study of former building inspection systems; laws, regulations and specifications including institutions and establishments of the system will be presented. On realizing this, the building inspection will be explained separately for public and private property buildings. In last part of the chapter, the causes why the former systems failed with earthquakes will be revealed.

On widening the information and database on search for alternative systems for Turkey, various systems from the world will be analyzed in Chapter 3. The systems to be presented are French, German, Belgium, English, American and Japanese in addition EU legislations and FIDIC Rules. The data collected in this chapter will be used in comparison of these systems with current Turkish systems in following chapters.

In following Chapter, Chapter 4, this time the current and recent building systems put into force after 1999 earthquakes will be studied. Firstly, Decree No 595 Having the force of law will be analyzed; extents, constituents, duties, liabilities and sanctions will be detailed. Then, Law No. 4708 Building Inspection Law will be analyzed in the same way.

The comparisons of systems after 1999 with various systems of the world will be studied in Chapter 5. For this purpose, a detailed table of comparison will be presented and on this table the comparisons, why KHK 595 has been cancelled and the lacks of current building inspection will be examined. At the end of chapter, the proposals of what might be performed to improve the current systems will be listed. Lastly, the further findings are summarised and concluded in Chapter 6.

In Appendix A, schematic illustration of French, German and Belgium Inspection Systems will be presented and lastly in Appendix B, list of provinces for which KHK 595 and Law No 4708 are in force will be illustrated. Moreover, an example of calculating the cost of service in Law No 4708 will be explained.

CHAPTER 2

FORMER BUILDING INSPECTION SYSTEMS BEFORE 1999

Forming and ensuring the functionality of settled building inspection system is a quite hard long time taking event due to excessive diversity and widespread properties of construction industry in itself. Besides, being more than one party in the system and with what proportion among whom and in what conditions the liabilities shall be shared, are significant subjects to be dwell upon. For this reason, whether the systems shall be executed under inspection of central authority if not local governments or other private institutions or it shall be in harmony with jointly participation of sides, is among the topics discussed especially in recent days. At this point, before discussing today's applications, it is considered beneficial to mention about applications before 1999.

In Turkey, the planning studies started at early 1900s. At this time, local plans for Topkapı Palace and Üsküdar Selimiye District with the order of Sultan III. Selim were realized by English architect Melinc; In Tanzimat Period, Mustafa Reşit Pasha carried out studies about how the Ottoman Cities should be. In 1848, "Public Buildings Regulation (Ebniye Nizamnamesi)" was brought into force. This regulation was about the improvement activities of some districts in Istanbul. Following this regulation in 1882 "Public Buildings Law (Ebniye Kanunu)" was brought into force and all improvement activities in Ottoman were strived to organize. In second half of nineteenth century, while the fact of

"industrial city planning" in West was being studied, in our country city-planning practice reached the age of development and the studies about important subjects particular to that period like improving inner-city roads and planning of settlement areas for immigrants were realized. After the revolutions with Independent War, improvement activities devoted to regulation of cities and towns (especially Ege Region) that got out tired and outdated from war, gained speed and local plans for a destroyed region were made by a French architect in 1924. As from foundation of Republic fourteen improvement plans were prepared in ten years. In real sense, first city planning studies started in 1928 with a competition to have the improvement plan of Ankara. Yet establishing new cities project had already started in England, realization of Ankara Project was impressive in view of revolution actions. In 1933, being considered as insufficient about directing the improvement studies, Public Buildings Laws was abrogated and instead "Municipality Buildings and Roads Law No: 2290" was brought into force so that first official interferences about planning were performed. With this Law No: 2290, duty to municipalities to have their 50-year improvement plans prepared was assigned. In 1956, with idea that Municipality Buildings and Roads Law was incapable of meeting country necessities, "Improvement Law No: 6785" was brought into force. By this way, it has been considered that a significant regulation was formed to guide planning and improvement matters for thirty years. In 1958, with Law no: 7116, the authority to approve the improvement plans was assigned to Ministry of Public Works and Settling. In 1985, Improvement Law No: 6785 has been shifted with Law No: 3194 and authority for plan approvals has been assigned to local governments instead of central government.

As mentioned before, studies for improvement plans in accordance with the developments in the world have 150-years history in Turkey. Improvement planning concept that has formed according to Turkey's conditions is quite original. Because till recent years settling, which has developed under influence

of political, social-economic, cultural conditions and different problems faced in this period, were analyzed by various and distinct planning approaches. Turkey, which began to grow and to become industrialized rapidly after declaration of

Figure 2.1. TUPRAS Plants just after August 1999 EQ

Republic came across with huge superstructure necessity and in addition to this, because of social-economic problems due to many reasons in this period; migration to big and industrialized cities has caused this necessity to increase. However, this rush in last thirty, thirty-five years has made a way for widening of big cities without improvement and city planning. Lack of conscious contractors to meet this demand, nourishing logic of a roof to shelter instead of quality for buildings, insufficiency of political governments, not evolved inspection mechanism to assure this much widespread control, incapability of government staff for such urbanization and construction as a result of rapid rush and consequently, birth of build-sell mechanism are the main reasons for the

irregularity and lack of planning. At this point, above mentioned topics might be summed under two titles: Improvement and Contractor (Build-Sell) (Table 2.1). Furthermore starting from 1970s, planning studies about areas for public and private investments have not been made and especially geo-technical studies have been ignored or evaded by lacking studies of poor quality. Rather than scientific and geo-technical studies, decisions because of land possession and similar factors about settlement areas have caused our cities and towns rise on woodlands, agricultural lands and unsuitable soils. Outcomes of these politics have dreadfully been experienced with earthquakes in Erzincan, Dinar, Adana, Gölcük and Marmara in recent years.

The situation in Turkey has been so unseemly for the Turkish contracting industry. Yet, anyone could easily be a contractor and assure the necessity of people for cheap and quick construction. In response to this, the companies existing for years and working abroad with quality and safety have unwillingly withdrew themselves. Unconscious, uneducated people have monopolized building construction with trade's mentality instead of being a product and thought of engineering. The fact that such uneducated people had a priority of profit rather than human health in connection with quality led us reach the position we have been recently.

To sum up, the deformity and irregularity of existing building production systems have been resulting from the insufficiency and not functioning of the inspection system and provision of legal spaces for whom knew to use them well. At this point, it is time to discuss the system it has been criticized.

Table 2.1. Irregular Urbanization

Causes of Irregular Urbanization	
Development	**Build-Sell**
Ambiguity of improved/unimproved areas Unjust land use for personal benefit Illegal and unauthorized constructions Squatter-house formation Lack of infrastructure Populist Political Parties in Power	Cheap Construction Contractors being uneducated or not being engineers Buildings of Low Quality Inefficient Infrastructure

2.1. Legal Arrangements About Building Inspection

In Turkey before 1999, being reference in various parts of laws, regulations and specifications; legal arrangements about building inspection were showing disorder. Accordingly, laws, regulations and specifications that could be related with building inspection are as follows:

A - Laws

- Law No: 3194 Improvement Law
- Law No: 2886 Public Procurements Law
- Law No: 818 Debts Law
- Law No: 3458 Law about Engineering and Architecture
- Law No: 1580 Municipalities Law
- Law No: 1593 Public Hygiene Law
- Law No: 3030 Law About Governing Greater Municipalities
- Law No: 6235 Turkish Engineers and Architects Chambers Law

B - Regulations and Specifications

- Regulation about Authorities, Duties and Liabilities of Scientists except the Engineers, Architects and City Planners Stated in Improvement Law Article No: 38.
- Typical Improvement Regulation for Municipalities Exempt From Law No: 3030
- Regulation for Application of Law No: 3030
- Ministry of Public Works and Settling, Design Inspection and Consulting Services Regulation
- Ministry of Public Works and Settling, Engineering and Architectural Services Specification
- Ministry of Public Works and Settling, General Specification of Public Works
- Ministry of Public Works and Settling, Regulation for Inspection of Public Works
- Regulation for Production and Crediting of Public Housing and Urban Environment on Municipality Lands
- Regulation for Structures to be Built at Disaster Regions

It is possible to separate the building type structures into two as: private property and public buildings. Article No: 2 of Law No: 3194 Improvement Law states that the private property and public buildings to be built in and out of municipality and contiguous areas are dependent to the commands of this Law. For this reason, it shall be a better approach to analyze separately how the building inspection system within the above mentioned legal structure is applied for private property and public buildings:

1- Inspection of Public Buildings
2- Inspection of Private Property Buildings

2.2 Inspection of Public Buildings

Public buildings include the structures belonging to central or local governments and depending on the related administration's choices, they are tendered by its own units according to Law No: 2886 Public Procurements Law. Despite this, some institutions claim to have not been included in this law depending on their private status. In general, public buildings are handed to institutions that had it constructed and these institutions are responsible of the possession, functionality and protection of those buildings. For this reason it would not be wrong to state that the inspection of public buildings should be realized more seriously than the private property buildings' but, important reason for this is the reality that the quality shall be at the highest level to ensure functionality and operating.

Inspection of public buildings might be either realized by the inspection engineer and teams assigned by construction department of the related administration or transferred to private companies with tenders. However second one is not a commonly used method since such an application is used for public infrastructure projects (dam, road, bridge, tunnel, pipeline etc.) considering the size and importance of the project.

Engineering and Architectural Services Specification by Ministry of Public Works and Settling defines the rules to be obeyed for purchase of engineering and architectural services. Besides, for the buildings whose drawings shall be prepared within this specification, there exists no command about design inspection although it includes professional inspection services. *Design Inspection and Consulting Services Regulation,* which was put into force by Ministry of Public Works and Settling, involves the purchase of project inspection services for government office and institutions, departments with supplementary budget, province private administrations, municipalities and

public economical organizations. Organizations authorized to be Project Inspection Consultant (PIC) are registered engineering and architecture companies to TMMOB and universities. Inspection service contains control by methods in use in Turkey and world and approval of all calculations with drawings on behalf of the administration. Furthermore, there shall be appropriateness between design inspections, all technical specifications and regulations determined by the administration that are currently in force in Turkey. The requirements for an individual or an organization of being project inspection consultant are qualification in education, experience and ethics. A Counselor Committee formed with participation from ministry, chambers and universities issues PIC certificate. The certificate is issued for three years to qualified individuals or organizations in their activity fields. Regulation explains the principles to be applied during design inspection services in detail. Fees for design inspection service are approximately 24 % of the contract price. PIC is liable of defects and faults in company with the designer. In addition, there shall be no relation between project inspection consultant organizations and designer. Even though the date of coming into force is recent (1992) and it includes many modern commands, *Project Inspection and Consulting Services Regulation* has been used by the Ministry for a few big projects, however in general, it has not been carried out for the projects realized by public organizations.

Applied principles for executing all construction and service works tendered to a contractor are regulated by *General Specification* of *Public Works (09.10.1984)*. All conditions related with inspection services in fourth article of the specification are in complete harmony with *Inspection of Public Works Regulation*, which will be mentioned in following paragraphs.

Figure 2.2. Roadway in Izmit after August 1999 EQ

According to specification, the contractor shall prepare constructional drawings of some featured works on condition that they shall be applied after approval of the administration. However, how to make design inspection for design approval is not stated. Besides, in the specification it is made clear that the contractor has the full liability for the defects and faults in the drawings, which he had them prepared even if they were approved by the administration. In this case, it is uncertain whether the design approval is given by authorized and well-informed unit of the administration as a result of detailed technical investigation or not. Although the general specification was published afterwards for drawings that the contractor had it prepared, it does not refer to *Engineering and Architectural Services Specification.* Arrangements about General Specification have not been made afterwards. In addition, general specification requires the contractor to prepare the as-built drawings after provisional acceptance.

Law No: 3194 Improvement Law contains exceptions for public buildings and structures to be built in village settlings. According to Improvement Law Article 26, building licenses for public buildings and establishments are issued in respect

of preliminary drawings on condition that they conform to improvement plans. Furthermore, all the responsibilities about drawings are transferred to related public organization. Improvement Law Article 27 regards the permission of chief as sufficient by canceling the building license obligation in village settlements.

Inspection mechanism for public buildings might be summarized as follows:

1- Pre-construction Preparations

a- Determination of improvement statement, preparation of improvement plans and subdivision processes if necessary
b- Investigation of possession
c- Solving the legal expropriation processes without any problem
d- Performing investment plans
e- Arranging budget regulations
f- Allocating appropriation

2- Design Phase

a- Preparation of construction drawings by construction department of related administration or at private design office by tendering
b- Inspection of drawings prepared by tendering
c- Approval in order to acquire the license from related municipality

3- Tender Phase

a- Preparation of Administrative and Technical Specifications of Tender

b- Tendering with methods stated in Law No: 2886 and determining the successful bidder according to articles of same law

c- Handing over of site to contractor after approval of Exchequer and Audit Department

4- Construction and Inspection Phase

a- Determination of Technical Official namely technical responsible

b- Last preparations of either the inspection organization formed in related administration's structure or private consultant companies pre-determined by tender

c- Realization of Construction

d- Acquiring the settlement permit (municipality, environmental health, fire brigade, Chamber of Architects, Chamber of Civil Engineers, and similar inspections)

e- Provisional and final acceptance

f- Final account and ending of relation between administration and contractor.

Inspections of all construction works of public organizations are realized in the scope of *Regulation for Inspection of Public Works.* For this purpose, an inspection organization for every site is formed which is composed of representative of employer with inspection superior and sufficient number of inspection chiefs, inspection engineers, their deputies and surveyors depending on size of the works. Duties of all inspection staff of the organization, which has

hierarchical structure, are described in the regulation in detail. Accordingly these are:

- Assuring the application to be performed in convenience with drawings and contract
- Assisting for solution of problems during construction
- Making necessary changes on the drawings and approving with the permission of administration
- Inspection of all material to be used by contractor and if necessary having them tested in laboratory by taking samples
- Warning contractor in case of detecting faulty works
- Stopping the works in case the contractor would not correct the faults
- Preparing contractor's progress reports and continuously reporting to administration about progress of works

Inspection organization is formed within the structure of Ministry and received inspection service is not a consulting service which the ministry provides from outside. Inspection organizations during inspection of works use a series of documents like attachments, minutes, progress reports, green book, tally sheet etc. Regulation even defines the behaviors of organization members during works.

Liabilities of contractor due to defects in construction are not reduced despite well-organized structure of inspection organization. Because organization is not liable in company with contractor in respect of his faults and defects of technical application and all the liabilities belong to contractor. Inspection superior has all sanctions about correcting application faults since he has the full authority in progress reports and payments. However, condition that the only responsible shall be contractor for the faults of both contractor and inspection organization is a subject obstructing the inspection organization to feel technically responsible.

For this reason interest field of organization changes into financial side more than technical and tends to prevent excessive payments in progress reports and to determine quantity of works.

With their significant duties, inspection organizations have a basic formation purpose of inspecting first technical convenience of production then correlation with drawings and workmanship, machinery and material quality. Its afterwards duty is preparing and inspecting the progress reports by observing the quantity of works realized in above-mentioned perspective and investigating whether the works progress according to works schedule. Yet, these inspection organizations could not be effective and insistent on performing their prior duties and came into the position of being controlled by contractors only with realizing inspection of progress reports. Nevertheless, municipalities, which issue settlement permits, have not seen any necessity for extra inspection. In general, inspections of foundation and the level over the sub-foundation that is about application of improvement plans have not been carried out.

It is required to look from different perspective for this situation of inspection organization. In general, public buildings are technically more complicated than private property buildings with the requirement of high engineering knowledge for both construction and inspection. Inspection organization to be formed shall be composed of experienced technical staff so that the duty would be accomplished. However, insufficient wages and opportunities for such technical staff that shall be given high responsibilities and whose training takes many years resulted these qualified staff to work in private sector rather than public. Consequently, neither by qualification nor by number, sufficient level of technical staff could be kept under public personnel. Furthermore, less qualified and knowledgeable staff in public got in close relation with contractors and started to work for contractors whom they are to inspect rather than public on behalf of which they perform inspection.

On the other hand, it seems that the inspection organizations were pushed into such a relation compulsorily. To overcome the situations like lack of allocation, late progress payments and some legal liabilities that put the contractor in difficult position, solutions like time extension, price difference, special unit prices and concessions about quality of work were applied. In such cases, inspection organizations mostly were incapable of sustaining the balance.

Actually occasional inspections were performed about quality for show only by inspection organization. By monetary punishments and corrections on some unit of works, public conscience was relieved and by the way, it was believed that administrative liabilities were accomplished.

In *Regulation for Production and Crediting of Public Housing and Urban Environment on Municipality Lands,* services executed on public housing regions except contracting are defined in a consulting system. Consulting services required for construction in Public Housing Regions are classified by three categories:

i. Managerial Consulting
ii. Design and Technical Services Consulting
iii. Construction Inspection Services Consulting

Above defined consulting services are realized on behalf of municipalities and are tendered by them as well. However, these organizations to undertake consulting services neither are allowed to make contracting works in Public Housing Region nor shall have any relation with such organizations. Organizations to seek for consulting services and to have qualification certificate appropriate with size of work are divided into five ranks at every consulting limit. Rank of company is related with its number of staff, quality and experience about its interest field. Successful tenderer in consulting service tender might be

a municipality organization having the same qualification requirements. Companies, which make “Consulting Services Contract” with Municipalities, are liable of compensating all the damages in case they cause the individuals and organizations related with project to undergo any damage because of faulty application. Besides, they are liable of insuring themselves against such compensation risks.

Inspection of architectural, reinforced concrete and installation drawings prepared by design and technical services consultant is under liability of Managerial Consultant. Managerial Consultant undertakes the duties like inspection of principles, acceptances, dimensions and calculations of all drawings writing on them and reporting the defects determined, assuring the removal of such defect in given legal period. The contract is abolished when the delay period exceeds the contract period by 30 %. Inspection of design is performed during drawing production phase by the staff in managerial consultant personnel concerned with project; if this would not be possible at the end of intermediate phases of project. Later stages are continued after inspections. Drawings organized by managerial consultant after inspection, are submitted to municipality. Improvement plan and application are inspected at the same time and approved.

Municipalities, before commencement of construction works, realize tenders for construction inspection services. Consultant is obliged to provide the technical staff, which he stated in his offer, at determined periods on site and municipality realizes their inspection continuously. Inspection organization similar to Regulation for Inspection of Public Works is composed of inspection superior, sufficient number of inspection staff, surveyors, laboratory staff and administrative staff in respect of the extent of works. Duties and liabilities of inspection organization are as follows:

- Inspection of all productions performed by contractor whether convenient with drawings and standards
- Having the used concrete be tested in laboratory when necessary
- Preparing construction details not included in drawings
- Preparing progress reports as basis for payments of contractor
- Continuously informing the municipality about progress of works and consulting when necessary
- Demolishing and reconstructing the defective works

Inspection organization is subject to penalty unless it could not complete the services in time stated in technical specification or could not provide compulsory technical staff on site.

Design and construction inspection systems executed in public housing constructions show similarities with consulting services of international projects. These similarities and basics of the systems are that:

a. It forms an auto-control mechanism in itself.
b. Independent consultants having legal authorities and liabilities perform inspection duties.
c. The consultants are subject to qualification concordant with their number of staff, quality and experience and merely are able to participate in tenders within the limit of their qualification certificates.
d. The consultants are responsible of having a professional compensation insurance -"liability insurance"- against their faults to cause monetary losses to employer or his partners.
e. Laboratory tests for determining concrete quality are compulsory.
f. The consultants perform their inspection duties as it has been aimed rather than police and while they are chosen, they are defined as the one to assist

in solution of problems and to ensure constructive relation between employer and designer or contractor.

Evaluation of whether the consultants responsible of inspection have performed their duties or not with the period of works and the application of penalty only for delays are among the negative sides of the system. Because, agreements of managerial consultant with design consultant on drawing mistakes and construction inspection with contractor on defective works could reveal only in long term, probably after a natural disaster. In this case, it is not clear how to revert the damages of people to liable person or organizations.

Law No: 8469 Law About Collection Methods of Public Credits, includes the articles about collection of credits like all kinds of taxes, fees and fines to be paid to public institutions, private institutions and municipalities and monetary fines of Turkish Penal Law with their conversion to imprisonment (Article 1). In other part of the law, requiring guarantee, personal guarantee, distrait in reserve, realization in reserve and other protective articles about preserving the public credits are defined. In the 4th article of related law, there exists an article about deferments and delays of debt and delay fines as a result of this for ones who has not paid his debt on due date.

2.3. Inspection of Private Property Buildings

In Turkey, mostly house, office, touristic buildings, industrial buildings and similar are counted in the extent of private property buildings. Nevertheless, it is a fact that the housing industry has the biggest share among the private property buildings. As mentioned before, private property buildings under following conditions shall be licensed by municipalities or governorship as required by Law No: 3194 Improvement Law:

i- Buildings in municipality and contiguous areas

ii- Buildings out of contiguous areas but stated in law.

In accordance with Articles 20, 21 and 22 of Improvement Law, building owners who would like to construct a building on land, building land or parcel that have title deed, rights of allocation and easement shall make applications to municipalities or governorships for acquiring construction permit. Required documents for license are: Title deed or allocation certificate, architectural, static, electric and installation drawings, design drawings and calculations and sketch of land. Municipalities and governorships issue building license in at most thirty days by investigating the documents.

Regulation for Application of Law No: 3030 About Governing Greater Municipalities, gives the authority of licensing and settlement permits about construction to district municipalities. It might be observed that the Greater Municipalities are coordinating institutions rather than institutions with direct place in building inspection. Because, according to related regulation for application (Improvement Applications Part, Article 9), all drawing approvals, issuing construction and settlement permits works are performed by district municipalities and these are realized under control and inspection of greater municipalities. In Article 10 of the Regulation, it is stated that the chairman of greater municipality has the authority to control and inspect the improvement applications of district municipalities. According to same article, this authority might also be realized by another inspection mean established for the same purpose. Inspection unit shall have the power to examine, investigate and inspect and detected illegal applications shall be removed by district municipalities. Otherwise, greater municipality shall use its authority to apply related decisions. It is a pity that none of the greater municipalities has formed such a technical purposed inspection organization since 1985 although they had the authority.

Along with engineers and architects due to Article 38 of Improvement Law, authority to design is also assigned to persons stated in *Regulation about Authority, Duty and Liabilities of Scientists except the Engineers, Architects and City Planners Stated in Improvement Law Article No: 38*. Accordingly, in regions where no municipality organization exists, these scientists are assigned the authority to design and prepare drawings for simple massive buildings not exceeding 3 floors including basement, a total area of 300 m² and whose biggest span and floor height are less than 4 meters and 3 meters consecutively.

Typical Improvement Regulation for Municipalities Exempt from Law No: 3030 defines required technical documents and license processes during application to municipalities. According to this regulation it is stated that the drawings be approved by related department of the municipality. However for the approval in question it is not explained to which principles the required investigation be based on, by which method and professionally who shall realize it. Only regulation observed to be compulsory as to this regulation is *Regulation for Structures to be Built at Disaster Regions*. But, this statement is no more than showing a reference since it is determined that the commands opposite of this regulation's commands shall not be used at disaster regions. In fourth part of the regulation, it is required that general position plan, foundation and basement plans, cross-section and side plans that are in the extent of architectural drawings for permit approval and steel or reinforced concrete calculations and drawings, roof installation drawings and calculations that are in the extent of static drawings for license approval shall be convenient with drawings and arranging standards accepted or determined by Ministry of Public Works and Settling.

An other property of Law No: 3194 in design inspection phase is that municipalities and governorships are subject to no legal liability or sanction despite their unlimited authority and freedom by law. Only difference between

governorships and municipalities in this case is Directorates of Public Works and Improvement, which is liable of design inspection in governorships, have effective technical staff capacity and internal inspection structure.

Figure 2.3. A view from Gölcük

A Technical Official as required by Article 28 of Improvement Law undertakes inspection liability of licensed buildings after design inspection. Technical staff that undertakes the technical liability is responsible of having the building be constructed in accordance with license and its appendices and otherwise informing to the municipality or the governorship about the situation. About this condition, the administration abolishes and seals the construction after detecting the case and one month period is given to owner as to Article 32 of Improvement Law. In this period, the seal shall be removed if the construction is brought to

condition convenient to license. In addition, as per the law, municipality council or province administration committee has the authority to have the construction be demolished totally or partly, if specifications or the drawings are not applied. Demolition costs are charged from the owner.

After completion of construction, owner shall apply to local government for "Settlement Permit". Related administration finishes the application in at most thirty days after examining the building.

Article 42 of Improvement Law contains the punishment commands about buildings built contrary to license. Monetary fines that the owner and contractor shall be given due to applications contrary to license are defined in relevant article and 1/5 of these fines are applicable for technical official. However, these fines have no dissuasive effect due to their very few amounts. After Improvement Law has been put into force, Law No 3506 has also been put into force for application of heavy fines and by this law some changes in Law No: 765 Turkish Penal Law and Law No: 647 Law on Penal Execution have been realized. Besides, it has been assured that the fines shall actualize connected to official salary coefficient as per Budget Law. Along with monetary penalty, in case of application of relevant administration to criminal court of peace, prohibition from profession punishment might be given to contractor and technical official of the building. Another authority assigned to municipalities and governorships is the determination of colors and types of exterior sides of buildings and roof materials for providing harmony between environment and buildings. However how much these commands are applied is controversial.

2.4. Constituent Institutions and Establishments of the Former System

The institutions and establishments included into the inspection system of private property buildings, which are listed in Improvement Law No. 3194 and the duties, legal status and liabilities of which are stipulated in the Code of Obligations and the Civil Code, are as follows:

1. Owner
2. Contractor
3. Municipalities
4. Governorships
5. Architectural Designer
6. Static Designer
7. Technical Official
8. Site Manager
9. Ministry of Public Works and Settling
10. Turkish Union of Chambers of Architects and Engineers

2.4.1.Owner

As it would be understood, owner is the person who is financially covering the construction work on his own account or having a third person construct the same under certain conditions. The liability status of the owner is arranged under the Code of Obligations, Civil Law and Improvement Law, and the owner has the right of recourse against other persons (contractor, designers). Accordingly;

a. Code of Obligations No. 818 stipulates in Articles 58 and 59 that the owner shall be liable with regards to defective construction or protection of a

building. The owner shall be required to take measures necessary to prevent damages that can be caused by a faulty building.

b. The buyer of the building shall examine its status and inform the seller of any defects, if determined. Otherwise, the buyer shall be deemed as accepted the condition. However, concealed defects shall be considered in exclusion of this. (Code of Obligations, Article 198)

c. In the event of the owner purchasing the building subsequent to completion of the construction, the owner shall be responsible for all defects and faults other than those concealed deliberately by the contractor and those that cannot be determined with an external examination. (Code of Obligations, Article 359)

d. In the event of the owner instructing or permitting works in breach with the art and technique of building despite all warnings of the contractor, all liabilities shall be borne by the owner. (Code of Obligations, Article 361)

e. The owner shall be held responsible also in the event of the building being constructed in violation of the building license and annexes or the improvement legislation. (Improvement Law, Article 42)

f. The Owner shall have the right of recourse to persons and institutions who are responsible towards the owner with regards to errors and defects under his responsibility. (Code of Obligations, Article 359)

g. The rights of the person placing an order with regards to defects in construction of an immovable against the contractor and project consultants shall be subject to a 5 year period of lapse of time as of the date of handing over. (Code of Obligations, Article 363)

The owner, who appears to be under a certain level of responsibility under the laws, does not have any liabilities in practice. Ownership is generally classified under three types in our country. These are singular structures (business center etc.), cooperative type buildings with several owners and ownership in the form of build-sell, which is unique to Turkey, in which the owner is generally the

person who owns the majority share in the building but who is at the same time the landowner. Said type of land owners with the aim of having a building on their land, the ownership of which is sometimes a matter of argument, give their land to contractors who make low quality constructions for the sake of owning more money, and naturally masses lacking planning and quality have been the outcome. Build-sell does not constitute a part of this study and shall not be discussed.

2.4.2.Contractor

Contractor is person or firm responsible for completion of a construction work from the initial phase according to an agreement executed with the owner. The construction work is realized with the financing provided by the contractor on the condition of provision of apartments or money to the owner as per a tender awarding or pursuant to agreement reached between the owner and the contractor. As it is the case in ownership, they have responsibilities of varying levels pursuant to the Code of Obligations, Civil and Improvement Law, as follows;

a. Contractors have a responsibility of first degree with regards to the construction works that they undertake. However, the contractor shall be responsible of compensation in the event of the contractor failing to fulfill his liabilities either deliberately or due to neglect. (Code of Obligations, Article 96)
b. In the event of the contractor being liable of compensation in a construction, work undertaken with a responsibility of first degree as per Article 96, said compensation is determined pro rata to the fault rate. (Code of Obligations, Article 98)

c. The Contractor shall not be freed completely from its liabilities undertaken during the term of the construction. Provisions reducing the liability of the contractor in the contract shall become invalid in the event of deliberate action or fault. (Code of Obligations, Article 99)

d. The contractor shall be responsible for the personnel employed by himself in a construction work (Code of Obligations, Article 100). Actions of those who are obliged to fulfill their work on their own account and independent from the supervision of the contractor and the employees who are determined as acting on their own initiative without the knowledge of the contractor shall free the contractor of his respective liability.

e. Various lapse of time provisions are available within the framework of the laws. Legal actions in which the contractors are charged on the grounds of failure in fulfillment of the liabilities in a partial or complete manner shall be subject to lapse of time of 10 years (Code of Obligations, Article 127).

f. Legal actions extending from disputes other than those stipulated in the above paragraph shall be subject to a lapse of time of 5 years. (Code of Obligations, Article 126).

g. The contractor shall be obliged to construct the buildings undertaken in accordance with the improvement plan, regulations, license and annexes thereof. (Improvement Law, Article 20)

h. The Contractors shall be subjected to certain penal provisions on the grounds of the buildings constructed in breach with provisions of Article 20 of the Improvement Law.

As it shall be understood from the legal arrangements stipulated above, the contractor is related with the organization and financing of a construction work and technically, there are no provisions that impose direct responsibility on the contractor in technical terms.

2.4.3. Municipalities

Municipalities are obliged to issue licenses to all private property buildings located in the municipality and contiguous areas (Improvement Law, Article 21). In other words, the owner/contractor is obliged to acquire a license from the respective municipality of the construction work. The same article of the Improvement Law stipulates that all modifications on the licensed buildings shall be subject to a license, excluding repairs and modifications that do not affect the building structural system. As it has been mentioned previously and although it is never observed in practice the control over, the compliance of the external faces of the buildings with the environment also rests in the municipalities also.

Municipalities elaborate the improvement regulations that shall be applicable within their borders. Moreover, all approvals and inspection processes related with buildings within their borders are also realized by the municipalities. The architectural and static designs elaborated for the buildings must be approved by the related units of the municipalities prior to the commencement of the construction. Moreover, the Improvement Law vests the authority to suspend and to demolish construction when required.

Municipality Law No. 1580 and General Hygiene Law No. 1593 are two laws that have been promulgated in the initial years of the Republic and are not expected to contain the modern building inspection concepts. Although these realized in the initial years of the Republic, constituted arrangements which were efficient in terms of the requirements of the date and which did not bring excessive burden to the municipality, which were fulfilled in a complete manner; today, these have become extremely obsolete for the current conditions. Said laws arrange the issues of issuance of building licenses and the duties and liabilities of the municipalities. The authority of the municipalities in terms of

issuance of licenses for construction, repair and annex constructions and abolishment of the buildings which are illegal or which do not have a license extend from Article 15 of the Municipality Law. The same article grants the right of prevention of buildings without a license, taking of measures against fire and improvement of the burnt locations. The municipalities are obliged to issue the technical inspection reports of all kinds of constructions and installations or to have said works realized by the closest establishment available in the event of an authorized establishment not being present within its body. Article 113 of the *Municipalities Law* arranges the penal provisions of applications without a license or in breach thereof. Accordingly, although practices of suspension of the work and imposition of fines to establishments without a license or in breach thereof are arranged, the provisions on buildings without a license are not clear.

Articles 250 to 257 of the General Hygiene Law No. 1593, grants the power of prohibition of the construction of buildings without a license to the municipality and requires that a certificate be acquired from the Ministry of Health for public buildings. The municipality shall be responsible for confirmation of the fact that there are no hygienic or technical hindrances against issuance of a license to the new buildings and ensure that owners make improvements on dangerous buildings that constitute a risk in terms of health and life of the inhabitants. However, in the event of failure of the building owner in realizing the improvement process, the municipality shall conduct the process on behalf and to the account of the owner. The approval of the governor or the district governor is required for issuance of said decisions. Moreover, the municipalities are authorized to impose fines on the owners who start using the buildings without acquiring a certificate from the municipality evidencing that the hygienic and technical conditions are efficient. In conclusion, although there is no weakness in terms of the building inspection officials of the municipality according to said two laws, it is determined that the legal liabilities that may emerge in the event of application thereof are ambiguous.

Municipalities and other local government units are responsible for rendering all kinds of social and technical services related with their respective region. Establishment of urban development and the socio-economic level of the people of the region are issues of utmost interest for the local government units and their main goal is to provide the urban infrastructure and improvement. Urban rate of development of a location also displays the socio-economic development level. Moreover, municipalities are also rendering the technical supervision services within their own jurisdiction. Municipalities are not responsible for so many services in any other country. Some provinces in Turkey have a population approximately equal to that of a country and the municipalities have been rendered inefficient in terms of building inspection capacity. Municipalities are not performing or unable to perform any inspection processes in the construction period. The same is applicable for the approval of the architectural and static designs. The only mechanism functioning at this point, the mechanism of bribing in order to have the design approved in a timely manner.

In fact, there is not much the municipality can do. Municipalities are unable to accommodate a technical workforce of such scope. Technical personnel of the municipalities of larger cities, which are inefficient in terms of quantity, are forced to deal with other tasks of the municipality before the inspection tasks. The situation is worse in the municipalities of the rural areas. There is one technical personnel for nearly 3-4 municipalities. Moreover, another inefficiency is the capacity of said technical personnel.

Another point of view is the inquiry of whether the municipalities are willing to perform the task of building inspection. The fact observed in Turkey is that the municipalities are not truly willing to perform the task of building inspection. Because the municipal understanding is based on the approach that the return of a service realized is generally acquired in the short term, the people personally

experience or see the service being rendered, and thus continuity in management is realized. For this reason, the municipalities do not want to use their time and resources, which are generally limited, for services providing long termed benefits like building inspection. When the building owners, who are unconscious on building inspection and who do not request building inspection from the municipality, are added to the system in which the above conscious is present, the situation turns into a mutual transaction where both the buyer and the seller is satisfied. Most interesting thing is that the municipalities have been authorized and assigned by the laws in the broadest sense despite their inefficiencies. However, the municipalities are not held responsible in any way whatsoever against said authorities and duties.

Improvement Law No. 3194 is another cause of the reluctance of the municipalities towards building inspection. The structure and contents of the law has adopted a principle that incites a new and rapid construction process with minimum inspection rather than the principle of safe buildings for a developed or developing society. This is another issue causing reluctance of the municipalities towards building inspection.

2.4.4.Governorships

Governorships have equal liabilities with municipalities in terms of duties and authorities. The only difference is the areas of liability. Governorships are responsible for execution of the license processes of the private property buildings located outside of the municipality and contiguous areas. (Improvement Law No. 3194). The same problems with the municipalities are experienced in terms of application and difficulties.

2.4.5.Architectural Designer

Architectural designer is the person responsible for the architectural designs of the building and is liable of elaborating the designs in compliance with the Improvement Law No. 3194. Subsequent to elaboration of the designs as required, these are revised in compliance with the instructions received from municipalities or governorships. Article 38 of the Improvement Law No. 3194 stipulates that an architect realizes the task of architectural designing.

2.4.6.Static Designer

Static designer is the person responsible for the static design of the building. They are obliged to elaborate the designs in accordance with the standards and specifications. Static designers shall consist of the related engineers in accordance with Article 38 of the Improvement Law No. 3194.

The current system has certain sections, which do not function with regards to architectural, and static design offices. Architecture and static offices are the direct addressees of the contractors and they are not granted any authorities in the practices in Turkey despite the powers and liabilities allocated by the laws. Although they cannot find an addressee for the complaints in the event of the construction process continuing in breach with the design, these ones come to mind after the static designers and site managers in the event of a damage occurring in the building.

Another issue is the simultaneous execution of the design drawings with the implementation at times in order to save time. The design drawings are elaborated to a certain extend or prior to the construction for some public buildings and scarcely for private property buildings. In said cases, some

designers were executing the vocational inspection process on behalf of the owner against an additional fee. In other words, the designers were supervising the compliance of the building with the design project, and this constituted a beneficial operation type for the time being.

2.4.7.Technical Official

Technical official is the person who undertakes the technical responsibility of the building in accordance with Article 28 of the Improvement Law No. 3194, and must be either a civil engineer or an architect depending on the type, size and significance of the building. Within the framework of said responsibility, the technical official must have the building constructed in compliance with the licenses and annexes thereof. They are obliged to notify the municipality or the governorship of any conditions violated by the owner or the contractor. Moreover, they must inform the related administration in the event of resignation from position, otherwise the legal liabilities shall continue. In the event of the technical official having the building constructed in a way that does not comply with the building license and annexes or the improvement legislation, they shall be subjected to certain penalties pursuant to Article 42 of Improvement Law No. 3194.

Although it has been defined in Articles 28 and 38 of the Improvement Law, the method to be applied by the technical official in the technical inspection of the construction has not been defined. The technical official shall have exclusive authority and shall be free in terms of the building to be inspected. Provisions related with supervision of the technical officials by the municipalities and governorships are not present in the laws. Only in Article 28 of the Improvement Law, the duty of keeping the records of the contractors in the respective region is allocated to the municipalities and governorships.

The post of technical officials is a party that is not defined in practice although stipulated by the laws. Especially in a profit-oriented structure like build-sell, the technical officials constitute a post, of which only the signature is required, does not, and should not serve any other function. It is a known fact that the technical officials mostly just apply their signature and not even visit the construction site once. Whereas, there are no site managers in most build-sell and other types of private property buildings and the construction is mainly executed by a foreman and qualified workman. Moreover, most of the build-sell contractors are not technical persons and these persons have a tradesmen background. Duty of the technical officials is generally undertaken by the designers or a civil engineer and is employed as the personnel of the contractor.

2.4.8.Site Manager

Along with the fact that the site manager post is not a position stipulated by the laws, the site managers are not found in majority of the private property buildings in exclusion of certain large buildings and private properties other than the collective housing constructions. Site managers are the technical parties who execute the technical aspects of the related construction work and thus undertake liabilities.

2.4.9.Ministry of Public Works and Settling, Ministry of Internal Affairs

Ministry of Public Works and Settling is the superior body responsible for elaboration and implementation of all kinds of specifications, regulations and laws related with improvement and buildings. As it is the case in other public

institutions, Ministry of Public Works and Settling is subject to the *Public Procurement Law No. 2886* in service procurement and rendering.

Ministry of Internal Affairs is the ministry with the authority of supervising the municipalities, which do not fulfill their building inspection duties, and municipalities are affiliated to this ministry. Due to the Ministry of Internal Affairs being structured according to administrative supervision rather than a technical one, it does not have the technical organization and staff to supervise the building inspection applications. No municipality has been subjected to an investigation by the Ministry on the grounds of not fulfilling their building inspection task during the term of enforcement of the current legislation. In the event of initiation of such an investigation by the Ministry, those responsible shall be subjected to trial on the charges of *breach of duty* pursuant to Article 230 of the Turkish Penal Law and *misconduct in office* in accordance article 240. The municipal improvement directors who do not implement building inspection can be shown as those responsible. However, holding the improvement directors guilty on the grounds of liabilities allocated by a law, which is subjected to debates on its functionality, does not seem to be fair.

2.4.10.Turkish Union of Chambers of Architects and Engineers

This is an institution, which has duties like fulfillment of the requirements of its professional members, protection of the vocational discipline and ethics, realization of various vocational activities and facilitation of various vocational activities. Vocational chambers are undertaking various positions in the system in line with said duties at times. In certain periods the Chambers of Architects, Civil Engineers, Mechanical Engineers ad Electrical Engineers have executed this task on behalf of the municipality in the design inspections realized by the

municipality. In addition to design inspection, it is known that the chambers assist the municipalities in terms of concrete quality and resistance quality.

Law No. 3458 on Engineering and Architecture (1938) stipulates those qualified for said titles. As defined by the law, those holding a diploma or certificate with the power as signatory are subjected to a fine in the event of misuse of said power and to imprisonment for a term of 1-3 months in the event of repetition.

Law No. 6235 on Turkish Union of Chambers of Engineers and Architects (1959) arranges the foundation guidelines of the Union of Chambers of Engineers and Architects and its affiliated vocational chambers. Registration to the related chamber and maintenance of the membership status is a prerequisite to the practice of the engineering and architecture profession in Turkey. However, said requirement is not applicable for the architects and engineers employed in public institutions. Article 26 of the Law, states that the members of the chamber shall be subjected to a penalty by the court of honor of the related chamber in the event of causing a loss due to negligence or deliberate action, defaulting in terms of contracts executed or acting in breach with the honor and respect of the profession. The most severe penalty applicable is expulsion from membership and those who are expelled on a permanent or temporary basis cannot practice their profession during the related term pursuant to Article 28.

As discussed in the previous sections, it has been stated that the building inspection system is being administered by the municipalities, governorships and Ministry of Public Works and Settling within the framework of the laws in force in Turkey. The technical inspection authority granted by the laws and regulations cannot be considered as the main cause of the unfit inspection, despite certain weaknesses and inefficiencies in the current legislation. The approach that the applicability of the current system can only be realized by those responsible who believe in the necessity of inspection brings is a new point of view to the issue.

The following can be stated for the non-functioning and inefficient aspects of the system:

1. As a result of the observations made, it is determined that the sections that do not function in the system extend from irregularity and disorder in practice rather than arrangements stipulated by the laws.
2. One of the most significant causes of this is that all inspection powers are vested in the local governments. However, an inspection from the improvement problems and designing phase to completion of the building constitutes an excessive burden for the local governments; neither the personnel nor the qualifications of the personnel are efficient for said system.
3. Local governments do not have technical personnel of efficient quantities and qualifications for design inspections.
4. Issuance of the power of inspection of all projects to the municipalities and governorships, notwithstanding their size or complexity is wrong.
5. Lack of methods and standards developed for use in inspections by the municipalities or the governorships to accelerate the design inspection of ordinary buildings and to determine certain apparent errors are efficiency.
6. Rapid increase of structuralization is another factor that causes the inefficiency in inspection.
7. Despite the authorities and duties allocated by the laws, the municipalities not being subjected to any liability exhibits the lack of significance given to the inspection. Neither the designer nor the person approving the design having a penal liability with regards to damages caused by defects that shall be determined in the future is a significant mistake.
8. Lack of a superior authority for determination and legal sanctioning of breach or misuse of office of the administrations in fulfillment of the inspection liability constitutes inefficiency also.

9. The post of technical official becoming only a signature and the resulting lack of control in inspections are important and thought provoking. The technical official, undertaking the technical responsibility of the building, not having qualifications other than being a civil engineer or architect and said officials not visiting the construction area after signing are the main causes of the heart-rending situation of the building system.
10. Determination and payment of the fee of the technical official by those being inspected i.e. the owner or the contractor, and said fees not being subjected to a basis are wrong practices.
11. Technical officials having certain liabilities but not having any power of sanctions is an improper application.
12. The inspection realized by the technical official or his failure in attending the work site not being supervised by the administration is also inappropriate.
13. The time necessary for collection of the fines imposed on contractors pursuant to Article 42 of the Improvement Law being long and devaluation of the monetary value of the fine are improper issues of sanctions.
14. Connection of the necessary infrastructure services such as electricity, telephone etc. by other administrations without the approval of the municipality or the governorships to buildings without a license or constructed in breach with the license, and said situation not constituting a legal liability to the administration causes disorder.
15. Municipalities and governorships not having a facility or mechanism for determination of buildings not in compliance with the license in exclusion of denunciation and the period required for demolishing of buildings without a license or in breach thereof being minimum one year, and the inefficiency of the municipalities and governorships in terms of vehicles, tools, personnel and security for application of the decision of demolition causes disorder and non-functionality.

16. Absence of criteria for qualification as a contractor and the contracting services being arranged in the scope of the Trade Law are missing.
17. In addition, lack of the requirement of having a site manager at constructions in excess of a certain size constitutes the inefficiencies.
18. Lack of an insurance system for every sides of the system to compensate the risks of construction is another main issue.

In conclusion, as it has been discussed in the previous sections, it is observed that the building inspection system, which is attempted to be enforced in Turkey prior to 1999 and is still in most provinces, is not an effective system. The legislation contains defects within the system and numerous inefficiencies in terms of the liabilities to be undertaken. Other laws related with the Improvement Law are inefficient in terms of achieving an effective building inspection. The outcomes of the 1999 earthquake resulting from the above have revealed the necessity of a new understanding of building inspection system in Turkey in a painful manner.

CHAPTER 3

VARIOUS SYSTEMS FROM THE WORLD

Building inspection, whose historical development has been explained previously, has various applications throughout the world. It is beneficial to make comparisons between other country's building inspection codes, European Union Regulations and FIDIC Rules in order to assist to better systems search in Turkey as well as fixing the problems of existent systems. Accordingly, the systems to be examined in this part are as follows:

1. Building Inspection Code in French
2. Building Inspection Code in Germany
3. Building Inspection Code in Belgium
4. Building Inspection Code in England
5. Building Inspection Code in U.S.A
6. Building Inspection Code in Japan
7. European Union Regulations
8. FIDIC Rules

3.1. Building Inspection Code in French

Due to effect of continuing historical background of the country and its society, French Building Inspection Code shows differences from other systems. While

in general such systems are made to be adapted to society after being formed by the governments, in French, the system has the characteristics of being formed by the influence of society itself. Starting from the early 1900s, reforms and revolutions as well as every field, also affected the construction sector, having the ownership fact and properly working property develop. For this reason, when the property is a building or a structure, property of good quality and properly working meant the safe structure of good quality along which a proper building inspection code should follow.

One of the basic characteristics of the French model is the significance of the insurance and its position in the system. In the system, because of continuing developments, insurance of building type structures became compulsory in 1978. Depending on this practice, two kinds of insurance was anticipated:

- 10 Years of Compulsory Insurance: Main structural elements, electric and other installations that could not be easily erected or dismantled are included in this type. Due to any damage that may occur to such type of elements, not only the contractor, but also do manufacturers of these elements have direct responsibility. Moreover, other structural elements outside building are in the extent of compulsory insurance.

- 2 Years of Optional Insurance: Other elements (ventilation, woodwork etc.) of the building are in the extent of optional insurance and are insured for a two years period after completion of the work. Both the contractor and the manufacturer have direct responsibilities in case of any damage.

There exist three parties in the French system. These are:

i. Fédération Nationale de Batiment : Trade Union of Construction Employers , representing the contractors.

ii. Technical Inspectors

iii. Moyen Administratif Pour la Reassurance de la Construction : Insurance Unions

Fédération Nationale de Batiment is one of the biggest trade unions in French which is mostly composed of infrastructure and heavy duty earthworks contractors. Having a widespread formation, this union represents approximately 50000 companies. Besides, this union has various research and development establishments and employs many qualified technical employees.

On technical inspectors side, there are six main inspection organizations in French. Among these, the biggest and the most important one is SOCOTEC, which executes nearly seventy percent of works, convenient with French Building Inspection Code.

Insurance companies jointly form Moyen Administratif Pour la Reassurance de la Construction, which is at the insurance side, and is semi-official subsidiary specialized in building insurance. This independent union is also organized in the country. It has a one and a half percent share among the entire general insurance activities turnover in French.

As mentioned before, French system gives a great importance to insurance subject. In this system, it is compulsory to insure every kind of public or private building whose construction area exceeds 170 m². While the insurance company guaranties to owner, at the same it has the construction of the contractor be controlled by an inspection company with purpose of lowering its risks. During the construction period, the owner is legally and frequently technically drawee with the insurance company. For this reason, the jointly formed organization by insurance union (M.A.R.C.) forms its own technical staff, and employs a group of specialists working per file. At this point, even though the position of the

inspection company is inspection of the owner's property on behalf of him, mainly it is to maintain the technical connection between insurance company and the contractor.

In the system, the functions of the municipalities and other local governments are limited to inspecting the convenience of architectural drawings to improvement, environmental conditions and city planning and issuing the building license as a result of these strict controls. Other technical inspections, due to severe sanctions in the system, are executed in a professional manner.

Meanwhile, the insurance amounts vary depending on the type, size and the importance of the buildings. Private organizations, which are formed under building federations to determine the insurance values, are also authorized to solve every dispute.

Consequently, French Building Inspection Code is a system, which mainly protects the right of the consumer as possible as it can be and satisfies the expectations of the individuals about strength and functionality. Sanction of the system is only monetary and monetarily equilibrium of mutual responsible is provided. One other important criterion of the system is adopting the idea of technical inspection spontaneously as taking the quality and strength of the buildings under guarantee by insurance. The system succeeds in catching the target success by active participation of every party in the sector.

3.2. Building Inspection Code in Germany

German Building Inspection Code is a regulation prepared to protect not only the right and the security of the individual or the owner but also the benefits and security of the society. Starting from this point, system anticipates every kind of

the building except some insignificant structures to be safe and at the level of required standards.

This system, even starting from the design phase, is executed strictly and this seriousness and strictness increase the reliance on the system in the society. At this point, the condition that separates German Code from others arises: Insurance. Even if insurance takes place in the system, it is not comparable with others. As follows: Unless a contrary condition has been agreed between contractor and the owner, the building shall be taken under guarantee for a five year period after receiving the building license. Responsibility is shared between the contractor and other responsible depending on the damage. Furthermore, liability insurance is compulsory by law.

Fundamentally, German system adopts the execution of inspection by independent inspection engineers (Prüfingenieur) who are also acknowledged by the government. It is 1920s when inspection engineering first started and by time despite some changes, it has never lost its functionality and importance. Increase in the building sector after II. World War has also a great influence on the formation of a disciplined and strict system and the necessity to practice it.

In Germany, which has a federal governmental structure, there exists a few differences between improvement and building inspection applications of the provinces and all accepted a typical regulation formed. Originally, named "Musterbauordnung der Bundesrepublik Deutschland" with its eighty articles indicates the details in application of the legal text named "Baugesetzbuch" (Improvement Law Book, including two hundred and fifty articles). These legal documents detail from design to turn key completion of a structure with rights, duty and liabilities of the parties to certain level of service life.

In German system, there exists Construction Directorates, which are formed by combined municipalities and small settlement units. The corresponding institute in Turkey is Improvement Directorates. Having authority and liability about construction of private property buildings, Construction Directorates are the direct drawee with either owner or the contractor about every inspection and approval of the building starting from construction permit until settlement permit issuance. Except some small determined by law structures to be built in their borders, construction directorates issue construction permit just after the design inspection. Settlement permit in the same way is issued in direction of reports prepared by the same inspection institute.

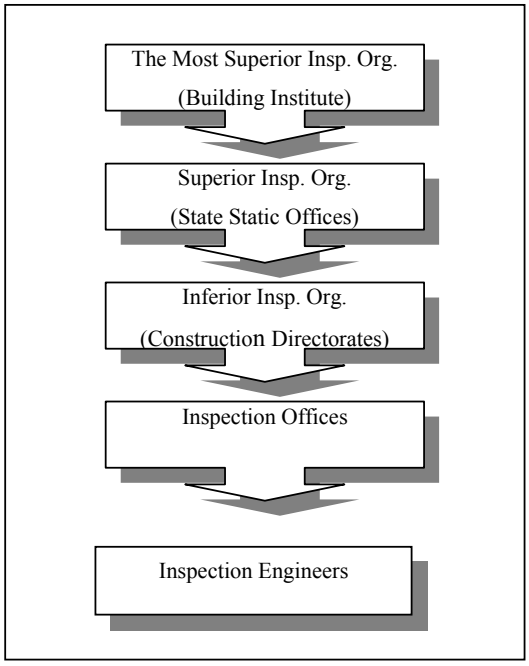

Figure 3.1. Inspection From Top to Down in German Inspection System

German Building Inspection system is composed of a series of person and institution that have separate working areas, functions and liabilities. Accordingly, above table is obtained starting from the top (Figure 3.1).

On the other hand, being the general principles same, all of the provinces depending on the regional conditions, formed various regulations for inspection of the structures to be built in its border. In one application, drawings (static, heat and sound isolation, protection against fire and earthquake), construction drawings and construction inspection are rendered compulsory. According to this, construction directorates get the inspection engineers or departments to make the inspections. However, inspections of tall or special structures or multi-used typical projects are executed by the Province Static Departments.

In the system, there is an obligation for public buildings to acquire the license. Yet, public institutions might inspect their own structures by forming construction directorates in their constitution. Besides, with purpose of increasing the project quality of public buildings, traditionally it is common to have the independent inspection engineers perform the design service.

Person and institutions with their function, legal position and liabilities in German system can be explained in following paragraphs.

3.2.1.Owner

It is a person or an institution that is the possessor of the private property building. It can provide the finance either by its resources or by taking a loan.

3.2.2.Architectural Design Offices

As well as controlling the building on behalf of the owner, they have the liability of architectural design. Starting from delivery of works to contractor until the end of construction works, they inspect the contractor regarding the owner's benefits, besides, they execute quantity and progress reports preparations. Architectural Design Offices are responsible of acting in direction of orders of building inspectors.

3.2.3.Static Design Offices

They are the institutions that undertake the inspection works on behalf of Construction Directorates and that carry the static design liability of the buildings. Being obliged to acting in direction of orders of inspection office and engineers, even inspection of the drawings by these person and institutions shall not save the static design offices from responsibility that may be revealed after damage. Responsibility is shared between every institution.

3.2.4.Contractor

It is the first degree responsible of construction works. It is responsible of taking the building under guarantee for five years unless otherwise stated in the contract agreed with the owner. Nevertheless, in case of such damages that may occur after having settlement permit, responsibility and monetary compensation is shared between every party, if negligence of responsible other person or institutions is determined. Contractor is obliged to obeying the orders of inspection institution.

3.2.5.Site Manager

It is a civil engineer or an architect who work for the person or the institution undertook the construction work and who takes on technical responsibility of the works during the construction period. Having a main duty of providing a construction convenient with architectural and static designs, site manager can be inspected by building inspectors, inspection engineers and offices.

3.2.6.Construction Directorates

These are units formed by combined municipalities and small settlement units. They are responsible of all kinds of inspection and approval works of private property buildings in their territory except some unimportant structures. They execute the inspection works from two directions: building inspectors in their constitution and independent inspection engineers acknowledged by the government. Construction Directorates act in the direction of reports prepared by building inspectors and inspection engineers whereas in case of an opposite action they are the liable of any damage that may occur. An uncommon application is that some municipalities form their own inspection offices to increase their incomes. Nevertheless, the inspection authorization of these departments is limited to some small and unimportant structures.

3.2.7.Inspection Offices

These are the institutions formed by greater municipalities in their constitution also legally acknowledged by the government. Working area of these offices is limited to some small and unimportant structures. Inspection is performed on behalf of the municipality and the responsibility is perceived as the inspection

responsibility of the inspected building. According to related regulation, head executers of the inspection offices shall be well educated on civil engineering and shall have experience at various management positions. Besides, it is taken pain that other technical staff in the office be highly qualified.

3.2.8.Building Inspectors

They are the technical staff in charge in constitution of construction directorates. Territory under responsibility of each construction directorate is divided into sub-territories and each sub-territory is given under responsibility one building inspector. Having a responsibility of inspecting the architectural drawings at the design phase, building inspector is a person who knows the improvement plans; building faces and infrastructure characteristics of the sub-territory it is responsible. They have the authority to abolish the construction if they discover a production contrary to drawings.

3.2.9.Inspection Engineers

Institution of inspection engineering is one of the most essential institutions of the German Building Inspection System. Inspection engineers are independently working civil engineers whose expertise and experience is officially acknowledged by the government. Inspection engineers perform the inspection works on behalf of the construction directorates. The Ministry of Internal Affairs gives the authorization of inspection engineering. For an individual to acquire this authorization, together with being well known by his professional experience

and personal characteristic, he has to be successful at the exam realized by a commission composed of professors and officials from ministry.

There are certain requirements to apply for this exam:

- At least to be a civil engineer for 10 years and to have worked actually
- To be a consultant engineer who is independent and in a free status
- To be knowledgeable about structural mechanics, structural systems and construction basics
- To be knowledgeable about building codes and laws
- To be knowledgeable about building materials, economy and ecological environment
- To have worked in big and special structures projects
- Advices of some other inspection engineers who proved himself technically.

Exams are realized in three different categories: timber, steel and reinforced concrete. Even if inspection engineers shall only work in their specialization, a few number of inspection engineers have an authority about all three categories. There are only three chances to participate in these exams at most. The one, who succeed in the exam, acquires the authority of inspection engineering and acknowledged by the government. Therefore, he can take on the inspection works of construction directorate in that region. Moreover, due to the authorization he has, he is able to perform the design services of the official buildings. In the basic of German Improvement System, in case of construction undergoing a change in usage and collapse of a building, owner, designer, contractor and site manager are liable all together.

Inspection engineering has a wide extent. They can perform every inspection about the construction. Since the inspection to be performed is given as execution of high authority of public law by the related office and has a quality

of incident, the position of the inspection is in the nature of public law. Inspection engineer advances to a person who performs inspection on behalf of the public only when does a municipality authorized to give building license assign a project to him. In other words, public service is at the project basis. On the other hand, the basics of the inspection engineering are not determined according to commands of Civil Law. Inspection engineer, because of the compulsory inspection for the buildings assigned to him, is responsible according to Official Law. The responsibility that he holds as an expert or specialized engineer on account of the inspection for the buildings whose inspection is not compulsory, is thirty years legally like every designer and consultant engineer. Besides, a particular public law relation arises between the inspection engineer and the assigning office. Due to some regulations, an inspection engineer is able to perform eight hundred inspections per year in healthy manner.

Both construction and settlement permits are issued with the approval of inspection engineers, and they have the authority to interfere during design and construction phases. This freedom given to inspection engineers shows itself evidently in design phase. During design controls, inspection engineers, beyond DIN Norms and approved publications of Building Institute, are free to behave with their own experience. Depending on the necessity, they may require some special calculations and safety limits to be determined. On construction inspection, pouring and quality of concrete and quality of reinforcement are investigated. Informing the inspection engineer about the time of concrete pouring and avoiding any process before inspection are among the duties of the site manager. Continuation of construction is only made after removal of the defects and mistakes detected by the inspection engineer and approval of this situation. Having an authority to abolish construction, in case this decision is not obeyed, huge amount of monetary punishment is put into practice to the contractor and all the staff in construction.

The fees of inspection engineers are calculated as a function of type of inspection, cost of rough works, and difficulty level of the structure. Being variable, this fee is, it is declared in different regulations. Nevertheless, inspection of construction might be calculated over the time worked and if so, the fee is paid by the construction directorates.

Public or private entrepreneurial might assign an inspection work to inspection engineers. In such a case, inspection engineer acts with position of a private expert and holds liability like an independent consultant engineer without the authority transferred to him by the public. In these circumstances, inspection engineer performs inspection for public buildings whose inspection is not compulsory and other structures (bridges, military structures etc.). In addition, inspection engineers give design service for private property buildings. However, being of inspection engineer the designer does not mean that the project cannot be inspected.

As mentioned before, it has been a tradition that the inspection engineers realize the planning and design of public buildings. Besides, having such authority by law, inspection engineers have too much responsibility. Despite this fact, as a result of research in Germany, it has been revealed that a small percent of the damages in the buildings are because of inspection engineers.

Inspection engineers are dependent to some restrictions like always keeping the professional knowledge at the highest level, not advertising and not giving employment announcement. Furthermore, he has to insure himself against the risks arise from professional activities on condition that they are appropriate with the current regulations.

3.2.10.State Static Offices

According to the regulations about construction, they are authorized to inspect tall and special structures and multi-usage typical projects. This institution is not only an inspection institution but also a research center that studies and accepts new calculation methods and details by investigating scientific publications. Inspection engineers and designers are informed about these acceptances, however, inspection engineers are free whether to agree or not with them. Another duty of the state static offices is making the arbitration in case of a disagreement between inspection offices, inspection engineers and designers.

3.2.11.Building Institute

A worldwide known institute makes researches on all kind of calculation methods and techniques about construction and other subjects. It has undertaken the duty of informing the professional community about its research results. The inspection engineers generally use techniques and calculation methods approved by the Building Institute.

3.2.12.Union of Inspection Engineers

The union, which has been established to provide a cooperation and solidarity among the inspection engineers, determines the fee and working conditions by making contracts with construction directorates and municipalities on behalf of the inspection engineers.

3.2.13.Insurance Institutions

Like other countries, insurance companies developed to service at building insurance subject for insuring the private property buildings. For insurance process, these companies require the building to have been inspected either by inspection engineers or inspection offices.

3.3. Building Inspection Code in Belgium

Belgium Building Inspection code formed to provide that all structures both at design and application phases should be subjected to a strict and serious inspection. All the public buildings and private property buildings shall be inspected. Inspection of public infrastructure works (dam, tunnel, roadway etc.) is mostly performed by the inspection organization of the owner public institution. Other public structures and private property structures like building and factory are designed and having constructed by an organization named SECO.

SECO, which is the most important building inspection organization in Belgium, successfully executes all inspection mechanism as a central single organization due to smallness of surface measurement and population of the country. In this perspective, the phases how SECO executes inspection works may be summarized as follows:

1. In Belgium system, for providing a planning made by an architect, application for taking the construction permit for every type of small or large building can only be made by an architect. Construction permit is

issued only after an investigation about improvement, healthy environment and protection of ancient works of art by the related office; on the other hand, architectural and engineering investigations are realized by SECO.

2. Duty of SECO commences by taking the construction permit. In this context, inspection of every building except some small ones with a construction area less than 150 m² is compulsory. If rural population of the country is considered and if existence of such structures is assumed to be in rural area, the percent of structures out of control is very low. Inspection continues from design phase until the end of construction phase. Showing a variation due to characteristics of the building, the fee for inspection is on the average, one percent of construction cost.

3. The design inspection realized by SECO is the inspection of structural system. For this reason, design office that prepares the drawings, presents a design file composed of calculations and drawings to SECO. SECO performs conformity inspection of the structural system with architecture, structural static and mechanics and strength principles. Besides, upon request, SECO shall perform the inspections of installation, architectural details and finishing works.

4. The construction inspection of SECO is executed in a way of on site periodical inspections and taking material samples for testing at the laboratories.

5. At the end of construction, as in France, a serious insurance issue is put into the agenda. With an aim of guaranteeing the strength and functionality of the building, insurance is not compulsory by law. However, as a common sense, building insurance is a widely used application. It is known that seventy five percent of the buildings inspected by SECO are insured. Parts

of the building inspected by SECO are public buildings, which show that insurance works also include the public infrastructure works. Accordingly, some properties of the insurance applied are as follows:

- Building insurance is for ten years.
- Twenty-five percent of insurance companies in Belgium have the authority to make building insurance by forming their own technical expertise service. As a result of the contracts these companies made between each other, they use typical price, insurance and formality.
- Main application way of insurance is taking the structural system of the building under guarantee first. Half of the insurance requests demand that the insurance include architectural details, installation and finishing works, and this condition is also solved by using standard insurance.
- In relationships between insurance companies, technical inspection company and owner, the guarantee is not given directly to the owner but to his technical representative, architect.

When generally studied, Belgium system has adopted the protection of the consumer rights principle, which is observed in two neighbor countries Germany and France. When studied from view of practice, it has combined the inspection engineering in Germany which has high authority, disciplined and executed by means of smaller units spread throughout the country, with the fact of big central office application in France, and together with participation of insurance companies, it has exposed the monetary responsibility in the system.

3.4. Building Inspection Code in England

The National House-Building Council (NHBC) is an independent institute, which regulates English building industry and sets various standards. NHBC, that established sixty years ago without any purpose of profit, is an institute provided a protection for over five million house owners (30 % of the houses in England). This worldwide known institute with its success in increasing the English building construction standards reached this achievement by setting standards for its registered contractors, as well as observing and inspecting them. Furthermore, it is continuously in collaboration with the consumer unions, credit organizations, representatives of the industry, local governments, professional and technical organizations and the government.

Inspector and standard setter role of NHBC got it from being only an insurance institute to such a beneficial institution to public that identifies and corrects the mistakes experienced continuously for improving the building industry in the long term. Institute has been an inspiration source for establishing a guarantee system for buildings in countries like other European countries, Far East countries, U.S.A, Canada and South Africa. Moreover, institute continuously invests in new technologies and staff training for developing the compensation and inspection services it gives to its clients.

Besides technical standards, institute gives service about topics like construction inspection of buildings, utilization of energy in buildings, planning inspection for health and safety. An independent council, which is formed of Consumer unions, city planners, technical consultants, architects, trade unions and contractors, manages institute. Contractors constitute one third of the council.

Contractors committed to Institute are obliged to obey to standards determined and published by the institute. NHBC examines insurance request at new or modified buildings, which are under its guarantee. For years, defect reports and experiences it gathered from applications of material and construction techniques, had NHBC develop various rules during site investigations starting from the first phase to the last phase of the construction.

In 1985, NHBC has been the first national authorized organization commissioned by the government as Approved Inspector for building inspection in England and Wales. Concept of Approved Inspectors was developed by the government to break the monopoly of local governments in building inspection, to increase and improve the quality of services. There are three institutions in the country to realize the inspection services:

1. Association of Approved Inspectors
2. Construction Industry Council
3. Local Government Association

In England, building inspection process is perceived as a convenience control of design and construction works independent from the contractor, with building regulations of the government and any component that shall influence health and safety of the design and owner are in the scope of the inspection. During building inspection, an inspector of NHBC or another approved inspectors organization takes place of the local government and inspects whether the construction process is realized in convenience with the regulations. Be the inspector either local government or an authorized inspector, an inspection period for inspection is not defined. Besides, one other common application is the typical design approval application. Any design approved in this practice, is allowed for application anywhere in the country by adopting with local conditions about topics like foundation and drainage.

In the service package of NHBC and other approved inspection organizations, which are a part of English building Inspection system, there are, starting from pre-application advices to an active site investigation process, during construction and lastly a completion certificate found.

During construction process, a structure is inspected eleven times on the average. However, with a new regulation, inspectors are required to give their attention on the sites that need their contribution most. Still, inspection shall be maintained at five main phases in the best manner:

- Sewerage
- Foundations
- Superstructure
- First Works
- Finishing

In case that the structure is not appropriate with the regulations, NHBC gives chance to contractor to fix the work but completion certificate is not issued unless the problems are solved. Process might be summarized with numbers and information such as:

- There are approximately eighteen thousand contractors registered to NHBC constituting the 85 % of all building contractors in England.
- During admission of applications, financial and technical capabilities of the contractors are investigated. In the scope of this investigation, technical interview, inspection of the construction of the applicant and financial controls are found. As a result of first investigations, 10 % of the applicants are rejected on the average.

- One of the conditions of application is that registered members of the organization should obey the rules of the organization and use the standards. Otherwise, there exist some punishments like severe monetary fine, getting back the guarantee, being dismissed from the organization. Moreover, NHBC announces the contractors who have not fulfilled his responsibilities to public.
- For instance, in 1997/98, hundred and sixty thousand buildings were inspected by NHBC.
- Having two hundred and eighty five inspectors present in NHBC, before usage of building materials, these inspectors perform nearly two millions inspection by intensifying mainly on the structure.
- Inspectors have all kinds of authority devoted to providing dismantling and reconstruction of defective works. However, regarding a contractor who does not ignore the warnings, discipline treatments are kept on and the sanction at the last point is cancellation of Buildmark, which is a kind of guarantee on the building.

Buildmark stands as surety for the responsibilities of the contractor and provides a structural insurance for the consumer. Upon foundation of NHBC, five million houses have been insured by Buildmark. Buildmark security provides insurance in three main categories:

- Before completion of building: If the contractor falls in a position of unable to continue construction works before completion, NHBC pays back the money spent by the owner or against the financial loss due to construction, pays either the highest amount in the insurance or 10 % of the construction costs, whichever is more.

- First Two Years: Due to Buildmark guarantee, the contractor is responsible of repairing the physical defects in the first two years. Contractor is

informed about the defects in a written way by the owner; unless the contractor does the necessity, NHBC, solves disagreement between contractor and the owner. Contractor is not responsible of openings, normal tension, general depreciation that arise from usage and the defects that may occur during maintenance. If the contractor bankrupted, NHBC would pay the repair costs in the extent of the insurance.

- Between Three and Ten Years: During these periods, the guarantees provided by NHBC are as follows:

  - Foundations, structural walls, outer coating, structural roof elements, slab coating, roof coatings, structural slab elements, retaining walls, multi-layer glass on outside windows and doors, and physical defects cost more than five hundred pounds observed at underground installation due to construction faults
  - Construction faults at gas pipes or chimneys that may or will give damage to physical health and security of the households
  - If temporary moving of households shall be a necessity for repair works to be performed, moving, storage, provision of temporary accommodation and all other related costs are covered by NHBC.

In standard Buildmark guarantee system, differing from some other insurance applications, doors, windows, finishings and central heating are out of insurance scope as well as defects that may occur due to natural disasters like storm.

In the system, there are different choices of insurance for the buildings inspected:

- Buildmark Choice: This choice has been especially developed for the building unions that need more flexibility. Similar to Buildmark, it includes both first two years and between third and tenth years. Being

different from only main structural defects, it provides covering of all kinds of physical faults with a certain increase in the insurance for every occasion. Moreover, extra protections like not execution of works by the contractor during construction and technical choices are in the scope of this choice.

- Modifications and Renewals*:* Being for ten years, in cases when the construction is realized according to NHBC standards, both Buildmark and Buildmark choice are applied to buildings recently modified and renewed.

- Solo for Self-Build*:* This type insurance, which has been developed for self-builders, provides a guarantee as long as it satisfies the NHBC standards. Main insurance covers the damages during construction and ten years after completion. Besides, there is a chance for insurance against defects that may occur six months after completion that was not repaired by subcontractors.

Some of the services given by NHBC, which has a wide range of working field, are health and security services for contractors and training services for construction industry (certification program for site manager).

3.5. Building Inspection Code in U.S.A

American construction is an important fact influencing Turkish construction industry from points of views of both functioning and technologies used. These influences might be observed with the investments made by big American companies jointly with Turkish companies in Turkey. However, it is obvious that there are differences in the systems due to huge distance with America both

geographically and culturally. For this reason, it seems reasonable to take European systems as Turkish models but along with considering practical and direct solutions of American systems.

Most of the American systems in principle are composed of a lot of unskilled, hardworking, applying human groups who are directed and managed by creative, innovative and regulator senior and top managers (Karaesmen, 1989). Construction industry is also in convenience with this general approach and, even number of senior or top managers are less than the ones in Turkey. Nevertheless, the sharp precipices observed in classification of technical staff in Turkey are not found in classification of the ones in America. Professional Engineer, P.E., which is an intermediate level manager, is a level gained as a result of a serious exam-interview and file investigation process after a four-year experience following a graduation from engineering-architecture undergraduate education. This title assigns the responsibility of design or construction management alone legally. The level of technical staff managed to reach this level is known to be 10 %. In addition, professional organizations evaluate the engineering and architecture education at the universities for protecting the professional prestige and quality. By this way, a prohibition is carried out for the graduates of a university until it removes the deficiencies of its undergraduate education. In the continuing American education system, such a punishment for a university means the loss of prestige and reference.

In America where liberal-capitalist economy is applied in the most free and dynamic way, being protected of ownership concept by laws has less importance compared to European societies. Changing hands of goods and possession in America is very rapid. For this reason the quality of a possession to be built, from point of view of satisfying ownership sense, is not the main issue like the examples in Europe. Still, existence of high standards of consumption and expectation causes the formation of inspection and quality in the system

spontaneously. Thus, from aspects of strength and operation comfort having been guaranteed for the buildings is an unavoidable obligation.

A private property construction in America can be realized easily without any financial difficulty because of support and easy flow of bank credits. Banks which have support on realization of settlement, construction and marketing works which have importance on flow of credit to owner and execution of works, may direct the owner to a common group, "developing company", if necessary. Owner shall assign an architect as the executer of design and construction works including shed constructions with 150-200 m² area. In greater and more important projects, predetermined developing company makes the choice of architect on behalf of the owner. In this sense, duties which the architect is the responsible of are:

1. Preparation of architectural drawings
2. Coordination in preparation of all other design drawings
3. Getting the building license from improvement and construction office of city administration
4. Consulting to Developing Company about procurement of construction works
5. Professional inspection during construction and in case the city administration calls for help, construction quality inspection to be executed with assistance of the engineer.

In execution of super and substructure works, a construction management group starts to work beginning from the first period when the connection with the design shall be maintained. It performs the construction planning on behalves of Development Company and the owner, determination of number and characteristics of main and subcontractor(s), coordination of these between each

other and designers and preparation of progress reports. This group is not concerned about the construction quality works.

After determination of the parties for execution of the works, people or organizations for inspection are in turn. On inspecting the design in small-scale works, the document with the signature of a P.E. level technical staff is approved without examination due to reliability of the institution of P.E. In medium and large-scale works, City Building Department has the inspection and approval works be done by independent inspection offices. The authority limit of every inspection office is the province it settles and the requirements of establishing such offices are being P.E. and having necessary references. Inspection offices perform inspection works according to Uniform Building Code (UBC), which is a regulation valid throughout the whole country. Being a very strong source, UBC is a regulation in which all the body of current law about improvement and building quality control and the most civil information as well as related rules are defined. Nevertheless, City Administration, which has the inspection offices make the detailed technical design drawing inspection work, executes inspection of improvement status in detail.

Construction permit shall be acquired only after the completion of above-mentioned works. Inspection of construction works is in turn following the design inspection and permit acquiring. Regardless of its properties, the structure to be built is absolutely inspected and city construction department does not interfere with these inspection works. Inspection works shall be performed by one of the either way:

a. For buildings like house, office etc. in small and medium scales, construction department assigns the architect with the inspection works that is also responsible of design. In this case, after having formed the necessary

teams and engineers the architect keeps on inspection activities until the end of construction.

b. In large-scale structures, construction department assigns one of the powerful building inspection companies that have the highest expertise. Running of legal quality mechanism is provided on behalf of the construction department and by the way, people responsible of design perform their professional controls. This situation provides the coordination of construction and design.

In American building inspection system, there exists no official rule about compulsory building insurance, being different from the European systems. Nevertheless, people and organizations included in the construction process are partly insured against various responsibilities and risks. To define partial insurance briefly:

- Development Company has itself continuously be insured against various uncertainties and risks. Especially in the scope of this insurance subjects like risk of paying compensation due to work of poor quality and damages during construction are dealt with.
- Being continuously insured the architect and engineering offices responsible of design are, among the subjects included in insurance, risk for loss of technical documents during execution is found additionally.
- Contractor and subcontractors continuously get themselves to be insured against damaging accidents, misfortunes and natural disasters during construction in addition to above risks.
- As mentioned before being not legally compulsory, insurance is a guarantee system used 98 % of all construction works in application. Actually, insurance policy might be requested as a legal document in some occasions. Some of the construction departments demand that architect and

engineering offices, to which they shall assign the authorization for inspection and approval of design projects, be insured. In the same way, private inspection offices assigned by construction department to construction works and land inspection accept the responsibility of inspection on condition that the contractor and the subcontractors are insured as well.

- As mentioned above, people and organizations in the system make various insurances between themselves and when all come together, a complicated situation arise. For this reason, general purposeful and comprehensive type insurances, which cover many risks at one time, have been developed. (Comprehensive General Liability)
- In some cases depending on the importance of the project, having stated that the insurances between parties are insufficient, the owner shall request extra risk-reducing guarantees. It is known that extra type of insurance policies have been developed and used for such conditions.

Inspection offices perform their duty according to whichever building specifications are valid in related province or municipality. At everywhere in the country, UBC regulation is used with a few differences from city to city. UBC, includes all of the rules about material, heat isolation, fire, lifts, roof covering; in summary all subjects in building construction. On the contrary, in Turkey, Specification for reinforced concrete and steel structures are prepared by Turkish Standards Institute (TSE), earthquake calculation conditions and regulations about building inspection by Ministry of Public Works and Settling, architectural necessities are by Improvement Offices of the Municipalities.

As a result, American system with the different dynamics from its culture is a good example to analyze that introduces various ideas on searching for alternative systems in Turkey.

3.6.Building Inspection Code in Japan

Japan is located at a region, which is exposed to frequent earthquakes and where the typhoons are so effective. Besides, urban settlement is extremely dense due to geographical characteristics of the country. After II. World War in 1950, "Building Standards Law" came into force for the purpose of regulating the building construction and improvement planning activities.

Building Standards Law was prepared to guarantee health, security of property and life of public, to determine the minimum standards about land, building and installation usage and to increase the benefits of public. This law is mostly valid for all of the buildings in the country. Some of the local governments make alterations on rules depending on their local conditions. A different side of the law is that, not only does it include models about building and installation but also includes the conditions of zoning like an improvement law or regulation. By doing that, it is aimed to create safety zones in the cities.

In this system, there are building officials similar to inspection engineers in German Building Inspection Code. It is compulsory for these people to pass the exam realized by Ministry of Construction and to be a certificated civil engineer or architect. Designations are in the authority of local governments. Building officials are like a kind of improvement director and shall be employed in settlements with population more than two hundred and fifty thousand.

Owners who want to construct a new building, to repair or to modify the existing, to modify the installations, shall acquire approval (license) from the related building official. In general, necessity for this approval is removed in case the construction area is less than 200 m². Applications for acquiring

construction license are replied in a written manner in twenty days and drawings are studied, even comments of related units are requested like Fire Brigade Directorate for fire safety. The owner pays a fee proportional to total area of the construction in question.

It is extremely significant in Japan to assure that the buildings be constructed with high quality and in a strict inspection mechanism. Realization of responsibilities properly by design engineers, inspectors and approval offices is attached a high level of importance. During the construction, the owner is responsible of commissioning a perfect engineer or architect to act on behalf of it for ensuring the application of drawings as anticipated. Building official might entrust some part of his responsibilities of building inspection to building surveillants in some necessary occasions. Abolishment of construction that does not satisfy with the specification of law or related settlement area might be asked for to the owner about the demand of building official. After certain time, dismantling, transportation, adding, reparation, rearrangement and correction of the parts in question are assured. Law defines briefly the processes to be executed against construction engineer, inspection engineer and contractor in case of violations.

Another feature of the law is that it defines the contrary ways to be applied by owners in case they conflict with the local building official and it describes the precautions to be taken by governorship or Ministry of Construction about the building official who has abused its duties. Some parts of the law were arranged so as to decreasing especially and firstly the damages of fire and natural disasters.

Building Investigation Committee, which is in the system, is formed of five or seven members. Committee is charged with developing and clarifying comments about subjects which the related governments have hesitation on applying

Building Standards Law and in addition it executes the investigation of operations of building officials, building surveillants and local governments in case of any demand. Members are selected among the people who have specialized on law, economy, architecture, city planning and who shall protect the rights of public, by the head of related local settlement.

In conclusion, basic principle of Building Standards Law is the idea that the strength against disasters shall be ensured by improving the quality of the building. The mechanism of improving quality has been regulated by providing the standards of projects with independent investigations and forming institutions like building officials and surveillants who are in charge with the improvement and construction works of the settlements. Besides, the structure of investigation committee has been arranged so as to responding to necessities of public.

3.7. European Union Regulations

It might be observed that the common denominator of all the systems examined up to this point is the building quality and protection of public benefits by building inspection. Moving from here, examining the protection of consumer rights related sides of European Union regulations from building inspection point of view shall be beneficial about evaluating existent systems in Turkey.

As from 1975, a series of "Consumer Protection Programs" have been consented by the Council of European Union. These programs deal with the consumer rights fewer than five basic titles:

i. Protection of Consumer Health and Safety.
ii. Protection of Consumer's economical benefits.

iii. Compensation of the damages of the consumer due to false goods and services.
iv. Training and informing of the consumer
v. Organization of the consumer and representation at decision mechanisms.

When above-mentioned titles are studied, it is revealed that the first three titles summarize the purpose of the building inspection as compulsory in a country whereas, fourth title emphasizes that the public be clarified about this regulation. At this point, some differences are observed between ensuring the titles devoted to building inspection; applications due to self cultures, historical backgrounds, laws, geographical characteristics, political structures and other reasons of the regions and countries; forming of the systems.

Because of the relation with the subject, basic principles developed by the Council about compensation of the damages of the consumer due to false goods and services are as follows:

- Service provider might be real or judicial person who is dependent on private law and gives service related to its professional activity, as it also might be an organization, which is dependent on public law and gives public service.
- Service provider, during its service, proportional to its fault is responsible of the damages to individual's health and physical integrity or physical integrity of portable and immovable possessions. The one damaged is responsible of proving the existence of the damage and the existence of cause-outcome relation between fulfillment of the service and the damage. On the contrary, he is not obliged to proving the fault of the service provider during fulfillment of the service. The liability of being saved from responsibility by proving the faultlessness belongs to service provider.

- On determining the fault, under normal and foreseeable conditions it shall be inspected whether the service provider has ensured the reasonable reliance expected from him or not. During performing the service or later, existence of a better service shall not be a cause for accusing of fault. In case the number of person responsible of the damage is more than one, these persons shall be successively liable in company.
- There are some anticipated limiting periods from the view of the rights, which are acknowledged to the damaged ones, about the liabilities of the service providers. For the damages to be compensated the damaged one shall make an application in three years starting from the day it finds out the identity of the damage and service provider or a reasonable period it would be found out. Under both circumstances, the right of compensation for the damaged one shall expire in five years starting from the date of provided service, which caused damaged. However, for services like design and construction for immovable possessions, these periods have been determined to be ten and twenty years.

3.8. FIDIC Rules

International Federation of Consulting Engineers (FIDIC) is an organization, which makes studies about development of professional and ethical standards and whose members are national engineering and consulting unions from all over the world. Due to its internationally acceptance and common usage, it shall be beneficial to examine the inspection systems and liabilities of the parties determined in Typical FIDIC Contract.

Typical contracts for the unit-price, lump sum and turnkey type construction projects have been prepared by FIDIC. According to these:

- In unit price and lump sum type construction works, building inspection shall be realized by inspection engineer,
- On the other hand, in design and turnkey type works, the building inspection shall be realized by the owner or his representative.

As FIDIC accepts that the inspection engineer realizes some of his functions in the capacity of owner's representative on behalf of the owner, on the other hand in some cases it anticipates initiative and independent actions or to act after consulting the owner or the contractor. However, inspection engineer in no case has the authority to reduce the liabilities of the contractor due to contract.

The contractor is obliged to presenting all the calculations, drawings, reports and technical documents before every stage of the construction for approval of the inspector. Besides, in turnkey type projects, the contractor shall be liable of forming a quality assurance system to prove that he conforms to appendices of the contract. In cases when the drawings are prepared by the contractor, he takes all the responsibility. FIDIC contracts state that the approval of the inspector does not redeem the contractor from his contractual liabilities and the inspector might require the correction of a defect at any time independent of other approvals until the final acceptance.

Due to FIDIC Rules, the inspector side has the authority to examine, inspect and test the material, installation, workmanship and progress of works in accordance with the contract at any time and everywhere. This authority is not only limited to inspection stated in the contract. The basic principle applied here is that if experiments and investigations about fields and characteristics different from the contractual ones are performed, the party revealed to be unjustifiable should undertake the financial liability. In other words, as a result of investigations and experiments that are not anticipated in tender documents and contract, if it

reveals that the contractor has no fault then the cost of such works shall be covered by the owner and the contractor shall have the right for extension of works. All the material, installation and workmanship shall be investigated and tested on site or at workshops where these materials and installations are manufactured belonging to contractor or someone else. Inspector might request the change of any staff with a reason of its inappropriateness for the work.

The contractor is responsible of informing the inspector for investigation and testing before covering the foundations or any parts of the works. Furthermore, on condition that the basic principle for covering the costs is applied, the inspector shall request the demolition of a part or a clarification for the purpose of investigation at every time.

The contractor is responsible of finishing the works, which have not been completed until provisional acceptance in the period between provisional and final acceptance and removing the defects, and damages that shall occur in the guarantee period. Inspector shall have such works be finished by other parties on behalf of the contractor unless the contractor fulfils this responsibility in a certain period.

Following the handing over of site area, the contractor is responsible of taking every pain for the works and protecting the works from commencement until the submission date of provisional acceptance. Correction cost of any damage in this period, which did not arise from the risks of the owner, shall be undertaken by the contractor. According to FIDIC, risks of the owner are listed under two titles:

- The unexpected risks which an experienced contractor shall not anticipate and take precautions.
- The risks, which are out of control of the parties and not easy to insure. (War, rebellion, famine, radiation, unexpected natural disasters etc.)

Such kinds of risks that could not been insured are undertaken either by contractor or owner depending on the liabilities on damages.

The compulsory insurances to be made by contractor are as follows:

a. Until provisional acceptance, against every defect and damage except the risks of the owner, works of project, machinery and equipment of the contractor shall be insured in the name of both contractor himself and owner. Even though this insurance is among the risks of the owner, it shall include defects and damages occur because of the drawings provided by the owner as it might also include the effects of the unexpected natural disasters. In addition, insurance shall be extended to include the defects and damages arising from the activities realized by the contractor to fulfill his liability during guarantee period.
b. On execution of works, owner and contractor shall make insurances in the name of themselves against the damages to third parties or their properties.
c. Contractor shall insure his workers against accidents.
d. In turnkey projects, contractor shall make professional liability insurance for his responsibilities in the project.

The period for above-mentioned insurance liabilities of the contractor shall at most be from the date of commencement of works until completion of works after having the final acceptance certificate. FIDIC does not include a condition about guaranteeing the owner against the liabilities of parties as response for the defects that might appear after completion of project during a certain time (20/10 years according to EU). However, even in case of submission of final acceptance certificate mutual liabilities of the parties continue from the view of unfulfilled responsibilities. This clause, especially for hidden faults, might be interpreted as;

the rights of owner are legally guaranteed for compensating the defects and damages that might be observed after completion of works.

While FIDIC rules used to leave the authority to inspection engineer for solving the disputes between owner and contractor, in recent years (FIDIC, 1996) the preferred choice is forming a dispute committee at the beginning of contract. This committee periodically and at critical construction phases shall observe the progress of works continuously by visiting the site and so shall be in position to solve the disputes to arise. Committee is generally formed of one or three members and on application of one of the sides; it gives decisions about disputes not in the capacity of an arbitrator committee but in the capacity of a group of specialists. On condition that the parties act together, they might take the comments of the committee before assigning the committee about the subjects with potential dispute. If one of the party does not consider the decision of dispute committee satisfactory, it shall inform the opposite parties and inspection engineer about its opinions. In such a case, they might seek the solution in court or other ways according to contract.

In conclusion, every system of different countries examined in this part have its own characteristics depending on its culture, history, geography, politics and other subjects likewise EU regulation and FIDIC rules which are the combination of many countries. In the search for better systems in Turkey, any part of these systems that is applicable shall be analyzed and outcomes shall be evaluated accordingly. For this reason, in the following chapters comparison of these systems with our past and present systems shall be made.

CHAPTER 4

BUILDING INSPECTION SYSTEMS AFTER 1999

4.1. Decree No. 595 Having The Force of Law

Decree No. 595 having the force of law (KHK 595), which came into force by being published in official gazette no 24016 at 10th of April 2000, is the first application considered as an alternative system instead of existing system after the earthquakes in 1999. According to 595, the aim of this application is expressed as:

" Providing the safety of health and property, preventing unplanned, uncontrolled construction of poor quality that cause waste of resources, production of construction with modern norms and standards by providing building inspection, protecting the rights of individuals damaged as a result of construction faults and assuring the compensation of the damages that might arise." (Article 1)

Extent of KHK 595 is determined as the buildings to be constructed in and out of municipality and contiguous areas. However, buildings constructed by public institutions and organizations subject to Law No. 2886 State Bidding Law and private laws are excluded in the KHK 595. Moreover, buildings with one floor excluding basement with construction area less than 180 m² are not in the scope of this arrangement.

Organizations and people defined in KHK 595 are as follows:

1. Ministry: Ministry of Public Works and Settling
2. Related Administration: Municipality for applications in contiguous area, governorship for out.
3. Damaged One: Real or judicial person undergoes substantial damage due to fault in construction
4. Building Owner: People having the possession right of the property
5. Building Responsible: Contractor, designer, site manager and building inspection organization that are in charge of construction
6. Contractor: Real or judicial person who undertakes the construction either by a contract with building owner with commercial purposes or by self-finance for itself.
7. Designer: Real or judicial person who prepares the study and drawings of building and who preferred the architecture, engineering and design services as its interest.
8. Site Manager: Engineers or architects who manage and realize construction on behalf of contractor.
9. Specialist Architect and Engineer: Engineers and architects awarded with specialization certificate by the union of chamber, they are dependent.
10. Insurance Companies: Insurance companies established subject to related law.

In addition to above-mentioned parties, definitions of building, construction period, construction fault, approximate construction cost, construction area and national liability insurance are also written in KHK 595.

Building inspection organizations are classified in three groups regarding the number of floors, construction area, importance and features of use of the

GROUPS OF INSPECTION ORGANIZATIONS IN DECREE NO 595 HAVING THE FORCE OF LAW

Table 4.1. Groups in KHK 595

Group	Type of Inspection	Minimum Technical Staff Required	Total Construction Area To Be Inspected	Over Inspection Authority	Limit of Authorization
A	***Construction Inspection***	(5) Specialist civil engineers or architects; at least (2) of them specialist civil engineer and (1) of them specialist architect	600.000 m² (Without any limit of floor, for every type of building)	In addition to minimum staff, every (1) specialist civil engineer and connected with (4) inspection engineers and (4) deputy inspection staff corresponds to 120.000 m² over inspection authority	Authorized to make inspection all around the country
	Design Inspection	(3) Specialist civil engineers with expertise on structural static, reinforced concrete and timber-steel system calculation			
	Installation Drawing and Inspection	(3) Specialist mechanical engineers, (2) specialist electrical engineers			
	Inspection Engineers	(20) Civil engineers or architect, (10) mechanical (5) electrical engineers			

Table 4.1. Groups in KHK 595

Group	Type of Inspection	Minimum Technical Staff Required	Total Construction Area To Be Inspected	Over Inspection Authority	Limit of Authorization
A	*Deputy Inspection Staff*	(20) Construction, (10) mechanics and (5) electric technical instructor or technician			
B	*Construction Inspection*	(3) Specialist civil engineers or architects; at least (1) of them specialist civil engineer and (1) of them specialist architect	360.000 m² (Except basement, up to fifteen floors for I., II., III. and IV. type buildings as defined in related declaration)	No authority for over inspection. On establishment before its first contract, (7) specialist civil engineers or architects, (1) architect or civil engineer inspection engineer and (1) deputy inspection staff; after completion of structural system (1) mechanical and (1) electrical inspection engineers with inspection staff for each shall be employed	Authorized to make inspection in province of establishment and (4) neighbor provinces
	Design Inspection	(1) Specialist civil engineers with expertise on structural static, reinforced concrete and timber-steel system calculation			
	Installation Drawing and Inspection	(2) Specialist mechanical engineers, (1) specialist electrical engineers			
	Inspection Engineers	(12) Civil engineers or architect, (6) mechanical (3) electrical engineers			
	Deputy Inspection Staff	(12) Construction, (6) mechanics and (3) electric technical instructor or technician			

(Table 4.1 Continued)

Table 4.1. Groups in KHK 595

Group	Type of Inspection	Minimum Technical Staff Required	Total Construction Area To Be Inspected	Over Inspection Authority	Limit of Authorization
C	*Construction* Inspection	(1) Specialist civil engineer (1) specialist architect	120.000 m² (Except basement, up to ten floors for I., II. And III. type buildings as defined in related declaration)	No authority for over inspection. On establishment before its first contract, (4) specialist civil engineers or architects, (1) architect or civil engineer inspection engineer and (1) deputy inspection staff; after completion of structural system (1) mechanical and (1) electrical inspection engineers with deputy inspection staff for each shall be employed.	Only authorized to make inspection in boundaries of province of establishment
	Design Inspection	(1) Specialist civil engineers with expertise on structural static, reinforced concrete and timber-steel system calculation			
	Installation Drawing and Inspection	(1) Specialist mechanical engineers, (1) specialist electrical engineers			
	Inspection Engineers	(4) Civil engineers or architect, (2) mechanical (1) electrical engineers			
	Deputy Inspection Staff	(4) Construction, (2) mechanics and (1) electric technical instructor or technician			

(Table 4.1 Continued)

building to be inspected as well as the minimum number of personnel to be employed and equipment to be used by the organization. (Table 4.1.)

Due to KHK 595, building inspection organizations that will give service to the buildings in the extent of building inspection carry on their activity only with the permission certificate submitted by Superior Building Inspection Commission. Accordingly, duties and liabilities of building inspection organizations are as follows:

Inspection of Design:

- Convenience of foundation system with geo-technical investigation report
- Convenience of structural system with TS 500 and Regulation for Structures to be built at Disaster Regions
- Convenience with " Regulation for Heat Isolation in Buildings", basics of architectural and engineering design arrangement, improvement plan, other regulations, specifications and national or international standards

Inspection of Construction

- Convenience of all kinds of materials and production to be applied in construction with standards and specifications, providing the nodal points in concrete, steel and structural wall elements and timber-steel systems, testing of these productions depending on the basics specified in specifications and reporting to related administration (Concrete shall be poured under supervision of deputy inspection staff of building inspection company. Concrete samples shall absolutely be taken at pouring place by engineer or architect with the laboratory technician to perform test.)
- Inspection of concrete formwork and steel

- Requiring from the contractor TSE certificate of materials used and the certificate proving that the workers and foremen working in construction are capable enough.
- Inspecting whether safety and health of the workers and foremen are assured by contractor and site manager

According to KHK 595, building inspection organizations are obliged to provide specialist engineers and architects in its constitution and shall these specialist engineers and architects own 51 percent of paid capital of the organization.

For the building responsible defined in KHK, records shall be kept. Accordingly, it is as stated below:

Table 4.2. Records of Parties in the System

Name of Responsible Person	***Name of Organization to Keep Record***
Contractor	Related chamber
Site Manager	Related chamber
Design Engineer	Related chamber
Building Inspection Organization	Ministry

On keeping these records, it is based on the reports prepared by province and district building inspection commissions. Among these reports, forwarding of building inspection record report to superior building inspection commission; building contractor record report to the related chamber of commerce; site manager, design engineer and specialist engineer and architect's reports to related chamber of professions shall be realized. Building responsible who gets

average record point less than 60 shall take negative record which at the same be based on information and documents. Building inspection organizations, which get negative record three times in last three years, shall be treated in accordance with required articles. On the other hand, other building responsible are treated by related chamber of profession.

Duties of Province and District Building Inspection Commissions are:

- To observe inspection activities of building inspection organizations
- To solve the conflicts that might arise during inspection activities
- To decide about the contractor's objection in accordance with 15th article of KHK 595
- To decide about applications contrary to KHK and to assure their adoption
- To arrange record reports of building responsible

Duties of Superior Building Inspection Commission are:

- To issue permission certificate to building inspection organizations
- To treat to building inspection organizations that act against to KHK 595 in accordance with 24th article
- To keep the records of building inspection organizations
- To investigate the objections in request of Province and District Building Inspection Commission

On condition that it shall not be less than the minimum service value stated in KHK 595 and by considering the project characteristics with physical, economic and social characteristics of the location of building; building inspection service cost is defined with the contract between owner and building inspection organization. This value varies between 4 – 11 percent of approximate building cost. If construction period exceeds two years starting from the date building

license acquired, the ratio basis to inspection service cost shall be increased 10 percent annually starting from 3rd year (Table 4.3). For the works extended to years, approximate building cost of application year shall be taken as base in calculation of building inspection service cost. The owner shall deposit difference in value that might arise in such condition to building inspection account.

Table 4.3. Variation of Service Cost of Building Inspection in 595

Total Construction Area (m²)	**First Two Years (%)**	**3. Year (%)**	**4. Year (%)**	**5.Year (%)**
< 500	8.00	8.80	9.68	10.65
501 – 1000	7.60	8.36	9.20	10.12
1001 – 1500	7.20	7.92	8.71	9.58
1501 – 2500	6.80	7.48	8.23	9.06
2501 – 5000	6.40	7.04	7.74	8.52
5001 – 10000	6.00	6.60	7.26	7.99
10001 – 20000	5.60	6.16	6.78	7.45
20001 – 30000	5.20	5.72	6.29	6.92
30001 – 40000	4.80	5.28	5.81	6.39
40001 – 50000	4.40	4.84	5.32	5.86
> 50000	4.00	4.40	4.84	5.32

Service cost of building inspection organizations shall be paid from building inspection accounts opened in banks on behalf of province private administrations or municipalities. These amounts shall be deposited to the

accounts by the owner and be paid to the building inspection organization with the confirmation of related administration.

In an inspection to be performed under conditions of KHK 595, specialist engineers and architects whose expertise were certified by related chamber of profession shall merely have authority to sign. By a temporary article until the realization of an arrangement in law about specialist engineers and architects, it has been anticipated that every engineer and architect who proves his actual experience of twelve years or more shall be acknowledged as specialist engineers and architect by related chambers of professions.

Duties and liabilities of design engineers (People responsible of design) are defined as follows:

- Preparing constructional drawings as a basis for building license including geo-technical reports, every kinds of studies depending on investigations in convenience with improvement plans, regulation, specification and standards
- Having these studies be inspected by building inspection organizations
- Removing mistakes and defects detected by building inspection organization and confirming to related administration

Duties and responsibilities of site manager are as follows:

- Managing and constructing the buildings in convenience with technical instructions of building inspection organization
- Making preparations for inspections after informing building inspection organization
- Participating personally to inspection and signing minutes and documents of inspection

- Informing people who prevents inspection to especially to building inspection organization, in case inspection might not be provided by it, informing to building inspection commissions

Civil engineers or architects shall undertake site management. However, other engineers of different profession might also undertake personally or partly depending on type of structure. Total construction area, which the site manager might be liable of, shall not be more than 30.000 m². Nevertheless, total construction area, which is to be inspected by inspection engineers, shall not be more than 30.000 m² for civil engineers and architect, 60.000 m² for mechanical engineers and 120.000 m² for electrical engineers.

The duties and liabilities of contractor in charge of construction might be summarized as follows:

- Constructing the buildings in convenience with science and art rules
- Applying the decisions given by building inspection organizations and commissions
- Maintaining, protecting the building during construction and removing faults and defects

There is an obligation of being registered to chamber of commerce for the contractor to assure its legitimacy. In case the owner is at the same time the contractor, this rule shall not apply.

It is obligatory to re-take the building license if the construction either will not be commenced in two years or will not be completed in five years after acquiring the license. In such case, contract between owner and building inspection organization expires. Required documents and information for process of acquiring building license are the ones required in Law No 3194 Improvement

Law and other laws except employing technical official as technical person. In addition to these documents, building inspection organization permit documents proving that insurance incentive payments were paid and contracts signed between following are required:

1. Owner ⟷ Contractor
2. Contractor ⟷ Site Manager
3. Building Inspection Organization ⟷ Owner

If contractor, site manager and the owner are the same person, there shall be no requirements of contract by submitting a written contract to related administration.

Building license shall be given only after the report by building inspection organization about partial or total completion of construction in convenience with its projects to related administration.

In case some or all parts of construction are realized contrary to license and its appendices, a report indicating the disagreement shall be given to contractor by building inspection organization. In direction of this report, contractor is liable of dismantling, repairing, replacing and renewing all types of construction and production. However, if the contractor prefers to object to this report, he might inform province or district building inspection commissions about his objection in seven days. If the contractor continues to act against warnings of building inspection organization or decision of building inspection organization and does not remove the incongruities, the construction is sealed by the related administration and relevant commands of law are applied. Restarting of the construction depends on affirmative reports of building inspection organization.

As stated in KHK 595, if relation of any person with building responsible is exhausted with the building, province or district building inspection organizations shall be notified about this situation at most in five days and somebody else shall be appointed instead in twenty days. Otherwise, construction is sealed by the administration and abolished until appointment of new person. Building responsible is liable of the activities until the date of end of their relation with the building.

Building inspection organizations and its shareholders, managers, specialist engineers and architects and their first degree relatives are forbidden to act as contractor, designer or site manager for works to which their building inspection organization gives service at the same time. Besides, specialist engineers and architects of building inspection organization in no way might be a contractor or site manager; nor can he be employed in more than one building inspection organizations.

In distribution of liabilities, building inspection organizations and specialist engineers and architects are fully responsible whereas other technical staffs are in proportion to their faults. Building inspection organization does not escape from the liabilities due to unfulfilled duties and liabilities of designer, site manager or contractor. However, because of the proof of fault about one of these, building inspection organization might transfer the related damage.

Building inspection organization is liable of constructional damages in structural elements of building that might occur after acquiring settlement permit for a period of ten years; constructional damages in non-structural elements of building for two years. Compensation of damages by building inspection organization is as in Table 4.4

Building inspection organizations are obliged to make insurances for every building separately before commencing inspection activities and a financial liability insurance for three years as from validity date of KHK 595. Purpose of this insurance is compensating the losses because of constructional damages that might occur. At the end of this pre-defined three years period, insurance companies are free to re-make the insurances. However, the insurance company shall notify superior building inspection commission about the reason of not making insurance. Guarantee of financial liability insurance for every building shall not be less than its approximate building cost.

Table 4.4. Compensation of Damages in 595

Possible Damage	**Liability of Building Inspection Org.**
Structural for ten years, non-structural for two years after acquiring settlement permit	Compensating damage/If the owner has removed the damage, making payment to him with prices of year of damage
Heavy damage and collapse as a result of expected natural disaster	Making payment to owner over approximate building cost of disaster year
Medium damage requiring strengthening	Paying the cost determined by designer and confirmed by related administration
Damage and collapse as result of unexpected natural disaster	Owner can not demand anything from building inspection
Damages occur as a result of modifications that affect structural systems without permission of administration after taking settlement permit	Liability belongs to one performed modifications

If building inspection organizations continue their activities contrary to KHK 595, their activities shall be temporarily abolished from six months to one year by superior building inspection commission. Managers, specialist engineers and architects of building inspection organizations whose activities are temporarily abolished, shall not be in any inspection activity even under another name.

Building inspection organization might inspect the geo-technical reports either by the civil engineer in itself on condition that it shall be in his expertise subjects or by employing a specialist geology or geo-physics engineer. Moreover, every inspection organization, which establishes materials laboratory, shall employ one specialist chemical engineer and two-laboratory technician.

KHK 595 has been put into force in twenty-seven pilot provinces, which has been listed in appendices. (Appendix B, Table B.1.) This KHK is the first step of better systems search despite its short life. Comments and comparisons about KHK will be discussed in further chapters.

4.2. Law No 4708 Building Inspection Law

After cancellation of KHK 595 by Constitution of Law Court, Law no 4708 Building Inspection Law has been accepted and put into force on 29.06.2001. Aim of the law is defined as follows:

" For the aim of assuring the safety of health and property, ensuring design and building inspection to construct buildings of good quality appropriate with improvement plans, science, art and health rules and standards and arranging the procedures and principles of building inspection"

The law includes buildings to be constructed in and out of municipality and contiguous areas except for the public buildings and establishments stated in Article 26 and buildings not subject to license as in Article 27 of Law No 3194 Improvement Law. Defined organizations and people in the law are:

1. Ministry: Ministry of Public Works and Settling
2. Related Administration: Municipality for applications in contiguous area, and for outside, governorship and other administrations with the authority to give construction and settlement permits
3. Owner: Real or judicial person with the possession right on the building
4. Building Inspection Organization: Real or judicial person giving service with certificate of permit issued by Ministry and whose all shareholders are formed of engineers and architects
5. Contractor: Real or judicial person, a member of related chamber, who undertakes the construction either by a contract with building owner with commercial purposes or by self-finance for itself
6. Designer: Real or judicial person who prepares the study and drawings of building and who preferred the architecture, engineering and design services as its interest.
7. Inspector Architect or Engineer: Engineers and architects whose memberships to related chambers continue and to whom inspector engineer or architect certificate has been issued

It is compulsory that due to law no 4708, completely paid capital written for person of building inspection organizations shall belong to engineers and architects and these organizations shall employ inspector engineers, architects, and deputy inspection staff. Shareholders of building inspection organizations shall be formed of architect, civil engineer, mechanical engineer and electrical engineers with the total maximum construction area of 720.000 m² that they are allowed to inspect. Besides, not only in the province they are established, but

also in other provinces where this law is valid these organizations might open branches. On condition that maximum inspectable construction area shall not be exceeded, requirement of branch opening is employing inspector civil engineer and deputy inspection staff that live in that province. Minimum technical staffs to be employed for establishing a building inspection organization are:

- 1 inspector architect
- 1 design inspector civil engineer
- 3 construction inspector civil engineers
- 2 inspector mechanical engineers
- 1 inspector electrical engineer

Inspector engineers and architects who will work in building inspection organizations shall document their 12-years-working experience. Inspector certificates issued by building inspection commission are valid for five years.

Table 4.5. Types of Inspector Certificate in 4708

Profession/Duty	**Type of Inspector Certificate**
Architect	Design and Application Inspector
Design Inspector Civil Engineer	Design Inspector
Construction Inspector Civil Engineer	Building Inspector
Mechanical and Electrical Engineer	Design and Building Inspector
Laboratory Staff	Laboratory Inspector
Other Engineering Professions	Design and Application Inspector

It is obligatory that deputy-inspecting staffs of building inspection organizations are also engineers. If needed, additional deputy inspecting staff might be charged

after informing building inspection organization. This commissioning situation exists if total maximum construction area, which inspector engineers, architects and deputy inspecting staff of building inspection organizations are authorized to inspect, is exceeded. Besides, construction inspector and his deputy inspecting staff are allowed work only in one province whereas other inspector engineers and architects have no such limitation.

Main duties of building inspection organization established as above are:

- Studying soil and foundation reports and construction drawings of land or area of the structure, which are prepared by designer, in accordance with related specifications; giving opinion of convenience only to related administration by controlling construction drawings and calculations
- Inspecting the convenience of prepared drawings with design arrangement basics, improvement plan, regulations of related administration
- Inspecting whether the construction is realized in accordance with license and its appendices
- Inspecting the convenience of construction materials and construction itself with drawings, technical specification and standards and documenting the results, performing the material and construction tests
- Submitting copies of all documents about inspection services to related administration, notifying related administration and province chamber commerce/industry about materials and construction contrary to technical specification and standards
- Warning contractor to take all precautions at site about safety and security of workers, otherwise notifying regional working offices about the situation
- Having the soil, materials and construction tests be performed at laboratories in accordance with specifications and standards

DUTIES AND LIABILITIES OF TECHNICAL STAFF IN 4708

Table 4.6. Duties and Liabilities of Technical Staff in 4708

Name of Technical Staff	*His Duty*	*Limit of His Inspection Authority (m^2)*
Inspector Architect	Inspection of whether the architectural drawings and construction are realized according to these drawings	360.000
Design Inspector Civil Engineer	Inspection of structural mechanics and reinforced concrete, steel, timber structure calculation and drawings with geo-technical reports	360.000
Construction Inspector Civil Engineer	Building Inspection	120.000
Inspector Mechanical Engineer	Design and Building Inspection	120.000
Inspector Electrical Engineer	Design and Building Inspection	120.000
Civil Engineer	Deputy Inspection Employee	30.000
Technical Instructor, Technician (Civil)	Deputy Inspection Employee	15.000

Table 4.6. Duties and Liabilities of Technical Staff in 4708

Name of Technical Staff	***His Duty***	***Limit of His Inspection Authority (m^2)***
Mechanical Engineer	Deputy Inspection Employee	60.000
Technical Instructor, Technician (Mechanics)	Deputy Inspection Employee	30.000
Electrical Engineer	Deputy Inspection Employee	120.000
Technical Instructor, Technician (Electric)	Deputy Inspection Employee	60.000

(Table 4.6 Continued)

Building inspection organizations, inspector engineers, architects in their structure, designers, laboratory staff and contractor are liable of the damages, which occur as a result of faulty and defective construction contrary to license and its appendices, science, art and health rules; in proportion with their faults to owner and the related administration. This liability lasts for a period of fifteen years for structural elements; two years for non-structural elements starting from acquiring the settlement permit.

Building inspection organizations are not allowed to be in an activity other than building inspection. Besides, it is forbidden that inspector architects and engineers of these organizations not take part in another commercial activity of profession or civil works during inspection activity.

As mentioned in law no 4708, building inspection commission is formed of a president who is appointed by the Ministry and is interested in the subject with the least at the level of general manager and four members the least at the level of office manager and continues its activities. Duties and liabilities of building inspection commission is summarized as follows:

i. Inspecting the activities of building inspection organizations
ii. Issuing inspector certificate to architects and engineers
iii. Issuing working permit to building inspection organizations
iv. Keeping the records of inspector engineers and architects
v. Giving opinion by investigating conflicts between parties during building inspection

On condition that it shall not be less than the minimum building inspection service cost, it might change depending on physical, economical and social properties of the region of the building. Accordingly, minimum service cost is about three percent of total construction cost. For buildings whose construction

periods exceed two years, this value is increased ten percent semi-annually. On the other hand, for building with construction period less than two years, it is decreased five percent for every six months (Table 4.7). Building inspection service costs are deposited in building inspection accounts by the owners, which are opened on behalf of province private administrations and municipalities.

Table 4.7. Variation of Service Cost of Building Inspection in 4708

Construction Period	Minimum Service Cost (%)
0 – 6 months	2.57
1 year	2.71
1,5 years	2.85
2 years	3.00
2,5 years	3.30
3 years	3.63
3,5 years	3.99
4 years	4.39
4,5 years	4.83
5 years	5.31

In cases like strengthening, modification, extra floor etc for which building license has to be re-taken, approximate construction cost is the cost prepared by design engineer and confirmed by the related administration. Approximate construction cost is determined with prices of the year at which inspection is realized. For works extended to following years, inspection service cost is evaluated with prices of the next years.

Building inspection records of building inspection organizations, architects and engineers are kept by building inspection commission depending on the reports prepared by related administration. According to these records, activities of the ones who continue to perform against law or who get negative records three times in last three years, are abolished and their certificates are taken back. Architects and engineers who get temporary activity abolishing fine and who cause this punishment shall not be in any inspection activity during this period. Inspection activities of building inspection organizations are ended whose activities are abolished three times.

Inspector engineers, architects and building inspection organization are dependent to commands anticipated in Law No 3194 Improvement Law for technical official about their actions and activities. Besides, in cases when no command exists in this law, other commands of related regulations are suggested.

If the construction does not begin in two years or could not be completed in five years after construction permit without renewing this permit, it is cancelled as required by Law no 3194. In this case, the contract between owner and building inspection organization expires.

As in KHK 595, Law no 4708 has been put into force in 19 pilot provinces.

After validity of Law no 4708, KHK 595 has been abrogated and incentive payments of financial liability insurance that were collected by building inspection organizations have been returned to owners.

CHAPTER 5

COMPARISONS OF SYSTEMS AND COMMENTS

5.1. Comparison Table

Subsequent to Decree No. 595 having the force of Law (KHK), Law No. 4708 containing provisions aiming at eliminating criticism towards Decree No 595, has been promulgated by the Ministry prior to publication of the reasons of annulment by the Constitution of Law Court. It is considered that comparison of Law No. 4708 discussed in the previous section with the building inspection systems/legislations in the previous sections and examination of the changes subsequent to KHK 595 shall be useful in terms of determination of the flaws and inefficiencies of the current system, and development of solutions for thereof. Thus, interpretation of Law No. 4708 is deemed appropriate in the following paragraphs under the light of the information provided in Table 5.1.

For this purpose, the following comparison table has been prepared in which the columns are the names of the systems to be compared; whereas the rows are the main titles which the systems will be compared. These titles are:

Inspection Authority, Liability, Insurance, Structure of Company, Inspection Mechanism, Inspection Conditions, Bureaucracy, Technical Staff, Sanctions, Cost of Service

COMPARISON OF TURKISH SYSTEMS WITH OTHER SYSTEMS

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System Japanese System	English System	Belgium System	American System
Inspection Authority							
Central	❑ Private Inspection Companies that can work in pilot provinces and are classified upon number of technical staff employed	❑ Private Inspection Companies that can work in pilot provinces	❑ Big Inspection Companies that can work all around the country ❑ 6 major companies exists ❑ For ex: SOCOTEC	❑ No central inspection system exists ❑ Inspection executed by independent inspection engineers all around country and building inspectors of construction directorates ❑ Inspection of high-rise and multi-use typical projects realized by Higher Inspection Institution (State Static Offices)	❑ Independent, non-profit, central, state acknowledged inspection organizations ❑ For ex: NHBC	❑ Big inspection companies that can work all around country due to small surface area ❑ For ex: SECO	❑ No central inspection system ❑ Design, construction and inspection executed by local governments ❑ Every inspection person or organization shall work in its province ❑ For small to medium scale works, architect is liable of inspection ❑ Special buildings are inspected by private inspection companies

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System Japanese System	English System	Belgium System	American System
Central				❑ Every inspection person or organization shall work in its province			
Local	❑ Limit of authority depends on group of company	❑ Companies shall employ building inspector technical staff living in city where the branch is desired and shall be subject to total inspection area limit	❑ Local inspection by country organization connected to head office		❑ Local inspection by country organization connected to head office	❑ Local inspection by country organization connected to head office	
Liability							
Duties	❑ Design inspection ❑ Geologic investigation report inspection ❑ Material and production inspection ❑ Sampling and testing ❑ Heat insulation inspection ❑ Work power inspection ❑ Safety of Works	❑ Design inspection ❑ Convenience with improvement law ❑ Geologic investigation report inspection ❑ Material and production inspection ❑ Sampling and testing	❑ Provision of inspection and technical guarantee between owner and insurance company, who also might be in charge directly on behalf of owner ❑ Assuring the construction of	❑ Design inspection ❑ Inspection of application projects ❑ Construction inspection ❑ Steel and concrete quality control especially before pouring	❑ Inspection of sewage system ❑ Inspection of foundations ❑ Inspection of superstructure ❑ Inspection of rough works ❑ Inspection of finishing	❑ Inspection from design phase through completion of superstructure until getting settlement permit	❑ Determination of an architect as the executer of design and construction ❑ Preparation of architectural drawings ❑ Ensuring the coordination for preparation of all other application drawings

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System Japanese System	English System	Belgium System	American System
Duties		❑ Heat insulation inspection ❑ Work power inspection ❑ Safety of works	buildings that satisfy the functionality and safety quality expectations of individuals				❑ Construction permit provision from related offices
Period	❑ 10 years for structural damage and 2 years for non-structural damage ❑ Full responsibility of building inspection organization and its specialist engineers and architects	❑ 15 years for structural damage and 2 years for non-structural damage ❑ Partial responsibility of building inspection organizations, inspector architect and engineers, designers, laboratory technician and contractors proportional to their faults	❑ Despite non-existence of a binding period for technical staff or the company, full liability during compulsory insurance period lasts	❑ Full liability during compulsory insurance period ❑ Professional insurance system exists ❑ Architectural project offices have the responsibility of architectural design, whereas static project offices the static project responsibility for period of 30 years	❑ Despite non-existence of a binding period for technical staff or the company, full liability during compulsory insurance period lasts ❑ The company is liable of insuring the company for 10 years	❑ Despite non-existence of a binding period for technical staff or the company, full liability during voluntarily insurance period lasts	❑ Despite non-existence of a binding period for technical staff or the company, full liability during voluntarily insurance period lasts ❑ Professional insurance system exists
Parties	Designers are liable of	❑ Building inspection	❑ Contractor is mainly liable of	❑ Architectural project offices	❑ Although the contractor is	❑ Architect is the main person	❑ Inspection of design projects

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System Japanese System	English System	Belgium System	American System
Parties	preparing application drawings due to geo- technical reports in convenience with license and its appendices ❑ Site manager is liable of constructing and managing the buildings according to technical instructions of inspection company ❑ Contractor is liable of construction convenient with science and art rules, applying the decisions made by building inspection companies and organizations	organizations, inspector architects and engineers, designers, laboratory technicians, and contractor are liable to owner and related administration due to damages as a result of defective, faulty construction contrary to license and its appendices, science, art and health rules in proportion to their faults	inner and outer elements of building, non-structural elements, strength reducing damages and defects in functionality ❑ Manufacturer of some parts and equipments is continuously main liable	Have the responsibility of architectural design, whereas static project offices the static project responsibility ❑ Contractor is the first degree responsible during the period of guarantee ❑ Site manager has the technical liability of construction ❑ Construction directorates are liable of damages due to contrary decisions to inspection engineer and building inspector reports ❑ Inspection offices have the liability of	responsible of physical damages in building, main responsible is the building inspection company	liable of construction ❑ Design file of engineering project office is inspected by inspection company	is under responsibility of a technical staff in level of P.E. for small-scale works ❑ In medium to large scale works, local government get independent inspection offices to control and confirm the design works ❑ Architect works with geo-technique expert, designer civil engineer, designer mechanical engineer and electrical engineer during design phase ❑ Developing Company is liable of

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System	English System	Belgium System	American System Japanese System
Parties	maintenance of building during specified period and compensating damages			❑ inspection for buildings they inspect ❑ Building inspector is liable of relatively smaller regions in territory of construction directorate he is connected to ❑ Inspection engineer executes inspection on behalf of construction directorate			Improvement, sub and super structure, landscape, construction and marketing
Insurance							
Compulsory	❑ Building inspection organizations shall make financial liability insurance every building one by one before inspection for period of liability against any structural damage	❑ No existence of compulsory insurance	❑ Structural and non-structural elements, mechanical and electrical installation of private and	❑ The contractor is liable of insuring the building for 5 years against any damage unless otherwise stated in contract with owner	❑ Standard type insurance guarantees against major structural damages to occur first 2 years	❑ No existence of compulsory insurance	❑ No existence of compulsory insurance

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System Japanese System	English System	Belgium System	American System
Compulsory			public buildings shall be insured for a period of 10 years ❑ No requirement for local governments and public organizations proving that they can compensate their damages		❑ Moreover, it also assures against damages in foundations, structural walls, outer coating, roof coverings, structural slab elements, retaining walls, windows, sub-structure installation for 3-10 years		
Optional	❑ Optional insurance varies due to different applications of insurance companies ❑ DASK	❑ There exists the application of optional insurance of buildings against earthquakes ❑ DASK	❑ Other elements (individual air conditioning, woodwork, taps etc.) of private and public buildings for 2 years	❑ Different applications exists	❑ 3 types of voluntarily insurance exists	❑ This type includes 10 years period ❑ First, it guarantees the structural systems of buildings ❑ Owing to demand, installations, finishing and other structural elements might be insured	❑ Every person and organization included in the system are insured in the frame of various responsibilities and risks

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System	English System	Belgium System	American System Japanese System
Structure of Company							
Limits of Inspection and Constitution	❑ It is obligatory that %51 of the company shall be owned by specialist architects or engineers ❑ Inspection organizations subject to limitations on m² basis due to their groups ❑ This limits shall be exceeded by employing extra technical staff	❑ All paid capital of company shall belong to inspector architects and engineers ❑ Total construction area to be inspected shall not be more than 720.000 m² ❑ In case of no other inspection work, no limit is applied on condition that the construction is on the same land and subject to single license	❑ There exists no limits either for center or local organizations of companies	❑ Due to some regulations in force, an inspection engineer could perform only 800 inspections correctly per year ❑ Construction directorates are responsible of certain regions; its building inspectors are responsible of sub-regions	❑ During construction, inspection companies inspects the building 11 times ❑ Due to NHBC data, 250 inspectors of NHBC perform nearly 2.000.000 inspections on materials before installation of structure ❑ Management of company executed by council of various participants	❑ There exists no limit of inspection	❑ There exists no limit of inspection ❑ Inspection offices shall be owned only by P.E.
Inspection Mechanism							
Role of Local Governments	❑ Municipalities and governorships	❑ In case that owner would not agree to rules	❑ Local government inspects the	❑ Construction directorates are in direct relation	❑ Local governments perform license	❑ Local government units execute an	❑ Local governments are liable of

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System Japanese System	English System	Belgium System	American System
Role of Local Governments	are liable of license and approval works ❑ Principles of getting the license are as in Law No 3194 ❑ Moreover, convenience of building with improvement and environment regulation shall be controlled ❑ By sending members to province and district inspection commissions, they contribute to well operation of inspection system	written in building inspection service contract, they have the authority to stop the construction, if it is the inspection company then they inform building inspection commission ❑ Greater Municipalities and governorships are liable of license and approval works	convenience of architectural project with improvement, general layout and landscaping ❑ All other technical inspections are performed by both inspection company and insurance company	with owner or the contractor about every inspection and approval of building starting from getting construction permit until having settlement permit	and approval works only	investigation dependent to protecting improvement, healthy environment and ancient works of art ❑ Architectural and engineering inspection left to inspection companies	executing inspection of design and civil works and depending on its properties, it shall be realized by private companies ❑ Convenience with improvement realized by local government
Inspection Conditions							
Public Buildings	❑ This KHK shall not be applied for	❑ Buildings and plants belong to public as stated	❑ Building of 170 m² or over are subject to	❑ Despite existence of no obligation for	❑ Inspection is performed by construction	❑ Bridge, dam, tunnel etc. constructed by	❑ Inspection is performed by construction

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System Japanese System	English System	Belgium System	American System
Public Buildings	Buildings to have built or be built by public institutions or organizations subject to State Bidding Law or other private laws	In 26th Article of Law No 3194 are not in the extent of this law	Inspection	Public buildings, big public organizations inspect the contractors by their construction directorates	Directorate of each public organization	Public is inspected by construction directorate whereas building, office or factory of public is designed and inspected by private inspection companies	Directorate of each public organization
Private Buildings	❑ Except basement, buildings of single floor with total construction area less than 180 m² are excluded, rest is subject to this KHK	❑ All buildings except the ones that are not subject to license as stated in 27th Article of Law no 3194, are included in this law.	❑ Buildings of 170 m² or over are inspected ❑ All buildings subject to inspection shall be insured	❑ All buildings except the some small and unimportant ones determined by laws, are subject to inspection	❑ All buildings except the some small and unimportant ones determined by laws, are subject to inspection	❑ Inspection of buildings except single floor with construction area 150 m² or less, is compulsory	❑ Building inspection system is valid only for private buildings ❑ All buildings except the some small and unimportant ones determined by laws, are subject to inspection
Bureaucracy							
License	❑ License and approvals works are performed by	❑ License and approvals works are performed by	❑ Due to insurance policy, bureaucracy is	❑ Inspection systems is purified from	❑ Inspection systems is purified from	❑ License application shall be made by an	❑ Getting the construction license works

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System Japanese System	English System	Belgium System	American System
License	Municipalities ❑ Applications are same as in Law no 3194 except for technical official part and extra documents might be demanded	Municipalities ❑ Applications are same as in Law no 3194 except for technical official part and extra documents might be demanded	Excessive ❑ License is given by municipality after inspections	Bureaucracy ❑ License and all kinds of approvals are made by construction directorates	Bureaucracy	Architect ❑ Bureaucracy is not excessive	Shall be realized by an architect ❑ Bureaucracy is excessive
Technical Staff							
Qualification	❑ Engineers and architects who have 12 years or more experience in profession proving his actually working are acknowledged as specialist by related chamber of profession	❑ Engineers and architects who have 12 years or more experience in profession proving his actually working are acknowledged as inspector by related chamber of profession	❑ Being technically well-informed and experienced	❑ Building inspector shall know the region well that they are liable of ❑ Requirements of being inspection engineer: at least 10 years of experience, being well-informed about static, structural systems, building standards and laws, building materials, economy and ecological environment	❑ Being technically well-informed and experienced	❑ Being technically well-informed and experienced	❑ P.E., who performs design and construction inspection, shall have at least 4 years of experience and references after graduation

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System	English System	Belgium System	American System Japanese System
Inspection Authority	❑ Total construction area to be inspected by engineers varies depending on different professions ❑ Civil Engineers and architects 30.000 m², mechanical engineers 60.000 m², electric engineers 120.000 m²	❑ Total construction area to be inspected by engineers varies depending on different professions	❑ There exists no limitation for technical staff	❑ Due to some regulations in force, an inspection engineer could perform only 800 inspections correctly per year	❑ An inspector might perform 8000 inspection annually	❑ There exists no limitation for technical staff	❑ There exists no limitation for technical staff
Sanctions							
Files	❑ As a result of kept files, activities of inspection companies might be stooped or permits be cancelled ❑ Sanctions might either be monetary or imprisonment	❑ As a result of kept files, activities of inspection companies might be stoped or permits be cancelled ❑ Sanctions might either be	❑ Sanctions are only monetary, quality is assured by substantial benefit balance	❑ Inspection engineers works in principles of Public law, not civil law and be punished due to it	❑ Depending on the damage, the sides might be punished in different ways	❑ Depending on the damage, the sides might be punished in different ways	❑ Depending on the damage, the sides might be punished in different ways

(Table 5.1 Continued)

Table 5.1. Comparison Table

	KHK 595	Law No 4708	French System	German System	English System	Belgium System	American System Japanese System
Files		monetary or imprisonment ❑ The judgments are due to related commands of Law no 765 Turkish Penal Law about neglecting and abusing the duty					
Cost of Service							
	❑ Depending on construction area and period, it varies between % 4-10.65 of total construction cost	❑ Depending on properties of construction with physical, economic and social characteristics of the region, it varies between % 2.57-5.31 of total construction cost	❑ It is approximately % 2.5-3.00 of total construction cost	❑ As a function of type of inspection, cost of main frame and difficulty level of construction, it varies between % 3-5 of total construction cost ❑ Pricing of hourly spent time on inspection might be applied	❑ Being a function of type of inspection, cost of main frame and difficulty level of construction, it is variable	❑ Depending on dimensions and importance of building, it is approximately % 1 of total construction cost	❑ Being a function of type of inspection, cost of main frame and difficulty level of construction, it varies between % 3-4 of total construction cost

(Table 5.1 Continued)

5.2. Evaluation of Comparison, Comments and Alternatives

Law No. 4708 reverses the issue of transfer of the public services to the private sector, which has taken place in the agenda for the first time with KHK No. 595 and which received significant criticism. In current legislation, legal status of inspection organizations is put into place of technical officials of Improvement Law, which has proved itself as a non-operating institution. The aim is to create a wholly independent inspection environment within the borders drawn by law. Although it has generally constituted a subject of debate, building inspection is being executed by private persons or establishments in the numerous examples studied. An important issue to keep in mind at this point is that said authority transferred is supervised in an effective manner by the public in said systems. Inspections are realized by either large scale central companies, approved by the state and the local branches thereof as it is the case in France, United Kingdom or Belgium, or by fully independent inspectors, granted the authority by the state and acting under the State control as in Germany, USA or Japan. Although varying based on contract type, FIDIC regulations also foresee a private inspection system executed on behalf of the owner.

KHK No. 595 has also transferred the authority of inspection to the private inspection companies grouped based on technical personnel employed. We see in the examination of Law No. 4708 that grouping is abolished in the authority transfer. Accordingly, each building inspection company would be authorized to inspect the constructions by employing the minimum technical personnel in pilot provinces designated. It is considered that this arrangement, which could not be observed in the examples studied and which could constitute certain problems in practice, would not be a suitable model. However, it is alleged that restriction of the inspection authority based on province/state as in Germany and USA shall constitute an unjust competition. On the contrary, application free of restrictions

has ensured that operation of the inspection system, lacking in provinces other than the metropolitan municipalities due to inefficient technical staff, by opening of branches with less number of technical personnel and continuity has been achieved in building inspection.

The responsibilities of the insurance and building inspectors also play an important role in the development of an effective building inspection system. Compared with the legislations of the countries and the European Union, it is determined that 595 and 4708 both designate the duty and responsibility to the building inspectors on the basis of the principle of building inspection in terms of functionality and quality and ensuring technical guarantee. Although the duties and liabilities of the building inspection companies defined in 595 and 4708 being the same, there is a difference in terms of liability period. The wording of "***Building inspection company shall be responsible for a period of 10 years for the damages occurring in the bearing system of the structure and 2 years for the remaining sections"*** in 595 has been revised as "***building inspection company shall be responsible for a period of 15 years for the damages occurring in the bearing system of the structure and 2 years for the damages in remaining sections"***. At this point, increase of the period of liability from 10 years to 15 years shall not be anything other than repetition of an error as stipulated in assessments for 595. Considering the economic life of 50 years stipulated by law and the earthquake possibility of 10%, said period to be designated needs to be 50 years logically. Considering the impossibility of application thereof in practice, said period designated is not meaningful. Moreover, although the decree arrangement only holds the building inspection establishments and the specialist engineers and architects thereof liable, Law no. 4708 holds the building inspection establishments, supervising engineer/architects and designers, officials conducting the structural material tests and the contractors liable pro rata to their faults.

The issue that needs to be focused upon is the building inspector establishing a professional insurance coverage against any kind of damage that may occur. However, as it is the case in 4708, the possibility of recourse of the loss to those responsible is an important issue in the application of professional insurance. In the examination of the systems of other countries we observe that the responsibility of the building inspector continues for the term of the insurance period and in the meanwhile every party to the system are insured against any kinds of damage that may be accrued. As we see in the models of Germany and USA, the concept of liability insurance is in place for protection of the losses of the parties. Any loss that may occur due to any damage shall be paid to the owner under the insurance to be provided by the building inspector company, and the insurance company shall have the right of recourse to other parties pro rata to their respective fault level. Thus, under such a situation parties of the building inspection system shall be protected under professional insurance.

Law No. 4708 has abolished the compulsory financial liability insurance foreseen under KHK No. 595. Premiums paid under 595 have also been returned. As it can be seen from Table 5.1, there are differences between the legislations in terms of compulsory insurance of the buildings. In the French system, which has the most developed understanding in terms of insurance in building inspection, the building inspector is required to provide a compulsory insurance coverage of 10 years for the main structural components, sanitary and electrical installations in private and public buildings, and the same period of compulsory insurance varies between 2-10 years in United Kingdom. On the other hand, compulsory insurance is not applied in the building inspection systems of Belgium, USA and Japan. In Germany, the contractor is obliged to provide an insurance coverage of 5 years for the building. FIDIC regulations require provision of insurance coverage by the contractor during the construction period but do not contain any provisions on terms of providing security for the future. The liability period varies between 10-20 years in the European Union legislation.

Other systems employ the concept of optional insurance in various forms. For example, other components of the private and public sector buildings, which are excluded from the compulsory insurance (private ventilation devices, joinery, taps etc.) in France, are subjected to insurance of 2 years; and several types of insurance policies are available against various damages in United Kingdom. While the bearing system and other components of the buildings are secured for a period of 10 years in Belgium where compulsory insurance is not applied, the system in America has adopted the method of partial insurance coverage of each entity and legal persons included into the system within the framework of various responsibilities and risks.

Optional insurance is dominant in the Law No. 4708. For this purpose, the Natural Disaster Insurance Corporation (DASK) has been founded two years ago with KHK No. 587. The main sanction of KHK No. 587 consists of the changes in the liabilities of the State extending from the legislations related with disasters. With the execution of the compulsory earthquake insurance, those failing to acquire an insurance coverage despite the fact that they were required to do so as of 27 March 2001, shall not be considered as beneficiaries within the framework of the legislation on natural disaster for loses to be covered within said scope. This means;

- The responsibilities of the State related with housing credit facility and building construction extending from Law No. 7269 on Measures and Assistance Applicable in Disasters Effecting the Social Life and other related legislations, are being abolished with the compensation to be paid by DASK for losses and damages occurring due to earthquake on buildings under insurance coverage.

- Pursuant to KHK No. 587, those who do not have valid compulsory earthquake insurance shall not be considered as beneficiaries under Law No. 7269 and other legislations for the tangible losses to be compensated under said insurance. In other words, the aid to be provided by the State in the scope of compulsory earthquake insurance shall not include housing loan facility or provision of disaster housings.

The area of the building, construction class and quality, the geological characteristics of the land on which the building is situated, seismic risk and similar factors are taken into consideration in the determination of insurance premiums. The objective thereof is determined as follows:

- Provision of insurance coverage for housings against affordable premium payments
- Risk sharing within the country
- Reduction of the financial burden of the state regarding construction of the post-earthquake disaster housings
- Benefiting from the insurance system as a means of healthy building construction
- Provision of long termed accumulation in recovery of the earthquake damages.

As stipulated herein above, the priority objective of the practice is to distribute the liabilities of the state extending from the damages in buildings after the earthquake, from a pool formed by premium paying building owners to the same persons. Thus, the State is freed of its liability of compensating the building damages caused by the natural disasters. There is a total 16 million housings (apartments) within municipal borders in Turkey and approximately 13 million is under DASK coverage. Within the two years since its foundation, the number of

insured housings is approximately 2.5 million as of October 2002 and a security of approximately 1 billion $ has been accumulated at the institution's pool for immediate use. It has been informed that models similar to said institution, which has been awarded by the World Bank, are being established in Mexico and Greece.

Nevertheless, DASK application has not been in demand as expected. The percent of buildings insured by DASK could only be about 15-20 % lately, which is disappointing. There are a few causes of this situation. One of them is the status of the DASK. As explained, it is an optional insurance, which depends on the wills of the owners. This makes the owners to feel no obligation for insurance unless they are conscious about the reality of earthquake or have ever experienced. Despite small amounts of premiums; at most for 50 USD premiums annually, an insurance amount of 20.000-25.000 USD might be insured, people has not been so willingly about it.

On the other hand, there still exists an indefiniteness and confusion about what will happen to people without insurance in case of earthquake. Will governments build houses for them or else? This situation became known especially after recent earthquake in May 2003 in Bingöl. The percent of buildings insured by DASK is around ten percent whereas the rest is not. What is expected is that the ones with insurance shall get their money from DASK and rest shall be supplied tents, food, clothes etc. until they settle into houses by themselves. However, the government declared that they would construct 2500 residences and more in case. At this point, it is not clear who will these residences be given to: ten percent with DASK or rest? If it will be given to rest of people, then DASK loses its meaning because the society shall believe that whatever happens the governments will supply them the permanent accommodation. However, if these residences will be given to ten percent, this might modify the structure of DASK because its mission is compensating damages of owners who paid its premiums

not contracting. Moreover, in such cases the tenders realized are the most discussed ones because they are open to any unlawful action due to the procedures of biddings.

As a self-criticism, the nature of DASK has some deficiencies. Insurance is based on risk-reduction concept that means anything in the extent of insurance shall be guaranteed by reducing premiums in time if experiences no damage. For example private automobile insurance. However, DASK requires fixed premiums annually and the parameters of DASK are not relevant to risk-reducing factors. So, DASK might be scrutinized to adopt it to nature of insurance.

In addition, DASK application might be compulsory like traffic insurance of automobiles. As it has to be paid fines during a police control if the car has no traffic insurance, a similar application might be performed to make it compulsory. These controls might be realized during different bureaucratic procedures like paying taxes, selling or buying etc. In addition, the governments shall get rid of populist politics by acting contrary to or in contradiction to laws. Otherwise, there is no chance to practice any law.

Another issue, which was criticized substantially and amended with 4708, was the partnership status of the building inspection companies. As it is known, the requirement of 51% being owned by engineers and architects in 595 has caused various discussions. Said situation has been changed by imposing the requirement of all paid-in capital of the company belonging to the architects and engineers in Law No. 4708. Although there are no provisions related with the partnership status of the companies in the systems of other countries studied, there are certain restrictions related with the inspection duty to be realized by the inspector in countries like Germany and England. The arrangements in force in Germany stipulate that 800 inspection tasks could be realized in a healthy

manner per year and according to NHBC data, 250 inspectors within its body could realize two million inspections on the structure prior to placement of the constructional components in England. Although there is a difference in terms of units, said types of restrictions are stipulated in 595 and 4708 also. While 595 brought restrictions based on m² of the buildings inspection company group, 4708 determined the total building construction area that can be inspected by each building inspection company as 720.000 m².

It has been observed that the supervision of the building inspector has been formed in accordance with the system structure of the countries studied, and thus there are different applications. In France and Belgium, the local governments control the compliance of the architectural design with the public works status, general layout and environmental rules, and all other architectural and engineering controls are left to the inspection or insurance companies. Because of the strict sanctions imposed in said countries, the concept of professional work has been established traditionally, and the central government does not realize any inspections beyond those conducted by the insurance companies. On the contrary, to France and Belgium, the local governments in Germany appear to supervise the inspector more frequently. The construction directorates at municipalities and the subdivision administrations formed by integration of small settlements are in direct contact with the owner or the contractor in all kinds of approval and inspection processes from issuance of the construction permit to issuance of the settlement permit. Said kind of an approach is made possible with the state conveying its authority to the independent inspectors. A similar approach is experienced in USA and Japan with the transfer of inspection authority of the local governments to the independent technical personnel called building officials. In fact, said kind of an assignment is more of a tradition than a legal necessity. In England, the companies are managed by councils formed of representatives of numerous parties in the system and public supervision is provided amongst them.

Provincial and district building commissions responsible for keeping the records of the building inspection companies pursuant to KHK No. 595, have been abolished with the with the Law No. 4708. The duty of the commissions, of which the reasons of non-functioning and non-function have been discussed in the previous sections, has been assigned to the Ministry of Public Works and Housing due to technical and financial deficiencies, arrangements providing for different interpretations and the resulting differences in application. Commission formed by the Ministry is responsible for settlement of the situations which could not be concluded at the provincial public works directorate and keeping the records of the companies and the engineers and architects. As mentioned herein above, this arrangement is an approach that aims at excluding the local governments from the processes of development, licensing and approval similar to that in France and Belgium. However, as it is stipulated in the rationale of the building inspection law, accepting the assumption that municipalities or governorships are not capable of inspecting the designs and the constructions, it is clear that the problems cannot be solved simply by transferring the authority without changing the Settlement Law No. 3194 and the related laws.

Moreover, TMMOB is emphasizing strongly that the chambers of professions are being externalized from the inspection process. The reason for this is shown as the Article 2 of 4708 defining the duties of the building inspection company as ***"examination of the soil and foundation reports for the land or field on which the building shall be constructed along with the final design to be elaborated by the designers, pursuant to the related legislation; control of the final design and calculations to be submitted to them directly by the designers and issuance of an approval to the related administration without the visa or approval requirement of another institution or establishment."*** which is claimed to prevent professional inspections, and the thesis that an environment and

conditions suitable for a structuralization process lacking quality and safety by thereof.

Various differences are observed between the legislations in terms of determination of the level of qualification of the technical personnel conducting the building inspection. France, Belgium and UK do not require a condition other than being informed and experienced in technical terms for becoming a building inspector. However in Germany, one must have been employed actually in the profession for a period of minimum 10 years in addition to knowledge on structural static, bearing systems, structural standards, laws, construction materials, economy and ecological environment in order to become an inspection engineer, and their expertise is determined on the grounds of the results of the examinations. The number of inspection engineers specialized in any one of timber, steel and reinforced concrete being specialized in all three is substantially low. USA and Japan requires a certain period of work and expertise after graduation. This period is stipulated as four years in USA.

KHK No. 595 has stipulated the duties and powers of the specialist engineers and architects to be involved in building inspection and the prerequisites to becoming a specialist engineer and architect have been arranged under KHK No. 601. Accordingly, the engineers and architects proving that they have 12 years of professional experience and knowledge are eligible for certificate of specialist engineer or architect. Said certificates are to be issued by the related chambers of profession. Law No. 4708 has abolished KHK No. 595 and 601 and the concept of inspector has been used instead of specialist engineer and architect. The law only defines the inspector architect and the engineer and stipulated that said title shall be used with a certificate to be issued by the Ministry of Public Works and Settling. The experience and information accumulation has been determined as twelve years again and said experience shall evidence on document basis. The main criticism out forward at this point is that it shall be impossible with the new

law to judge real experience and lack of experience, and the difference between qualified training and unqualified training. It has been insisted constantly that each diploma did not have the same meaning, that architects and engineers, who did not develop their knowledge base and who could not keep up with the technologies and developments of the era, should not be involved in building inspection which required good service, and that the knowledge and experience of the architects and engineers must be determined with various examinations. It has been alleged that such a practice impeded an effective inspection.

Another issue, which has become evident after numerous earthquakes and especially after the earthquakes of 1999, was the sanctions applicable to those responsible. Dimensions of the sanctions and penalties according to the Improvement Law and other laws in force had been examined in the previous sections. Examination of the sanctions in other systems under the light of the Table 5.1 shall be useful before commencing discussion of provisions of 595 and 4708. We see that the sanctions in our first model of France are of monetary form. Mutual material balance of the people in the system could be possible with an effective insurance awareness. Moreover, France constitutes one of the best models that gives priority to quality and functionality in the building and which provides for best comprehension of said idea by the parties in the system in a professional manner. Those responsible in Belgium and UK are subjected to penalty pro rata to their fault in terms of the laws. Definitive penalty provisions could not be determined in these two legislations. In Germany, the inspection engineers are conducting the building inspection, which is a public service on behalf of the local government. Due to said service being a public service, the inspection engineers are subjected to penalty in accordance with the provisions of public law rather than the civil law. The liabilities of the inspectors are presented in the first section of UBC on the penalty provisions applicable to the building inspectors in USA, and it is stipulated that the sanctions are imposed in accordance with the related laws. The European Union legislation stipulates that

the parties shall be held liable in a chain reaction in the event of damage occurring. FIDIC legislation stipulates that a committee formed in advance should reach a decision in the event of a fault or incompliance, and provides for a solution in accordance with the laws of the country in which the project is realized by application to court in the event of one of the parties not accepting the first settlement. However, as it is known FIDIC provisions do not provide a guarantee in the long term and these remain valid as of work commencement until the final acceptance of the work.

In KHK No. 595 and Law No. 4708, the records of the building inspection companies the specialist/inspector architects and engineers are kept. Pursuant to 595, building inspectors with a point under average sixty in their records because of the reports issued by the provincial and district commissions; receive a negative record entry. The building inspection establishments with three negative record entries within the last three years receive a provisional suspension from duty and actions are realized by the related professional chambers for others responsible from the building. Both monetary and imprisonment penalties can be imposed pursuant to 595 however the applicable laws are defined in a clear manner. In 4708, the registers are issued by the related administrations and kept by the building inspection commission. In addition to the sanctions, it is also stipulated clearly in the law that the building officials, contractors and laboratory personnel who violate and misuse their powers shall be subjected to provisions related with violation and misuse in sections three and four of the Turkish Criminal Law. Moreover, it is stated that said penalties could not be converted into fines or deferred. Said situation may be considered as a positive step towards prevention of the confusion in terms of penalty provisions.

Inspection of public buildings is an essential component of the building inspection concept. Accordingly, the duty of inspection of public buildings is being realized by the construction units formed within the body of the local

governments in numerous countries. While inspection of all buildings over 170 m² is required in France, insurance is not compulsory for local governments and public institutions proving that they can repair their damages in a rapid and complete manner. In Germany, licensing is not required for the public buildings. Belgium has a different application in which the bridges, dams, plants etc. constructed by the Public institutions are inspected by the construction directorates established within their body; and the housings, workplace buildings, factories etc. are being designed and inspected by private inspection companies. In FIDIC application, generally, the projects are public projects and the inspection thereof is appointed to separate inspection groups with separate tenders.

KHK 595 was not to be applied in the buildings to be constructed by institutions and establishments subjected to the State Tender Law or specific laws on this issue. Pursuant to the Law No. 4708, the buildings and facilities of the public stipulated in Article 26 of the Improvement Law No. 3194 were excluded from the coverage of said provisions. Moreover, in compliance with this article, in the event of the related administration undertaking the liability, licenses were issued to public buildings pursuant to their preliminary designs. Due to the fact that building inspectors defined in Law No. 4708 are replacing the technical official stipulated in the Improvement Law, they do not constitute a difference in terms of inspection of the public buildings.

595 and 4708 do not differ greatly from the other countries with regards to arrangements related with the private property buildings to be inspected. A summary is given in the following Table 5.2.

Exceptions stipulated in Law No. 4708 are defined as "***Construction and completion certificates shall not be required for the housings and structures for animal breeding or agricultural purposes to be constructed at and near***

village settlement areas and pastures by those registered at villages and living permanently in villages in exclusion of the municipalities and contiguous areas…. " in Article 27 of the Improvement Law. As it can be understood from the table, a great difference does not exist between the current legislation in force and the systems of the other countries.

Comparison of the service fees reveals great differences between KHK No. 595, other systems and Law No. 4708. While the service fee varies between 4-10.65% depending on the construction area and construction period of the building pursuant to 595, the service fee stipulated in 4708 varies between 2.57 – 5.31% depending on the physical, economic and social characteristics of the construction region and the construction period. However, a point requiring caution is that the financial liability insurance imposed on the inspection companies in KHK No. 595 constituted 1.5 – 2.0 % of the building cost. This indicates that the differences between the minimum values are closer to one another in 4708 and 595. However, with the addition of the insurance cost for the building inspection companies, who are not subject to a compulsory insurance but who intend to acquire a professional insurance coverage, the resulting rates are actually low. We see that the rates are approximately at the same levels when other countries are examined.

Accordingly, because of the variable function of various factors it ranges between approximately 2.5 – 3.0 % in France and 3.0 – 5.0% in Germany because of the strict insurance approach. The same rate is 3.0 – 4.0 in USA and the service fee is determined based on hours of work of the inspector. Belgium is the country with the lowest rate with approximately 1.0 % amongst others. In conclusion, the rates stipulated in Law No. 4708 is approximately same as those in other countries, it is believed that fulfillment of so many duties in a worthy manner shall be difficult when the high costs extending from high insurance rates shall be taken into consideration.

Table 5.2. Minimum Limits of Inspection

Building Inspection System	**Minimum Characteristics of the Private Property Buildings Defined**
KHK No. 595	Private property buildings in exclusion of the single storey structures and those with a construction area less than 180 m², excluding the basement floors.
Law No 4708	All private property buildings to be constructed within and outside of the borders of municipalities and settlement areas, excluding the buildings not subject to licensing pursuant to Article 27 of the Improvement Law No. 3194.
France	Buildings of 170 m² and over
Germany	All buildings in exclusion of certain small and insignificant structures defined by the laws
UK	All buildings in exclusion of certain small and insignificant structures defined by the laws
Belgium	All buildings in exclusion of the single storey buildings with a construction area less than 150 m²
USA	All buildings in exclusion of certain small and insignificant buildings
Japan	All buildings in exclusion of certain small and insignificant buildings

In conclusion, after above comments, following basic facts are considered as crucial for establishing a building inspection system with highest functionality and efficiency:

1. Building inspection is a whole consisting of interconnected and complementary processes. Said processes are planning, designing, construction and inspection processes. The modifications to be realized on the current system must cover all of said processes and should not prevent

integrity of inspection. Thus, Law No. 4708 is an action aiming at arrangement of the inspection construction processes, and other required arrangements need to be realized in order to provide for effectiveness. However, the number of arrangements needs to be limited with the consideration of achievement of the internal harmony of the mechanism itself.

2. An effective and serious building inspection system must aim at developing the liability structure along with the technical and financial guarantee, as seen in the other models in the world. While achievement of the technical and financial guarantee is material fact, liability is a concept. The presence and functionality of liability within the system constitute the foundation for healthy achievement of the technical and financial guarantee. Therefore, number of new technical and administrative establishments to be formed and a realistic distribution of responsibility among these is an important issue.
3. It is natural that the parties constituting the system shall be exclusively public or exclusively private or joint structure. The issue that draws the most reaction is transfer of public liability to the private companies by the public institutions. However, the applications up to date indicate that the public authorities could not fulfill the inspection activities due to various reasons. Moreover, withdrawal of the inspection activities from the local governments shall lead to local governments focusing their technical and financial interest of the inspection process to planning, i.e. development and urban planning.
4. Transfer of authority does not constitute complete exclusion of the public authorities. Naturally, the State shall and should supervise the duty transferred. However, as it has been stipulated in Law No. 4708, realization of supervision in a centralized manner rather than by local governments is inappropriate. Supervision of inspection must be provided locally by the commissions formed of representatives of various parties.

Thus, a stricter public inspection shall be provided. As it is known, provincial and district commissions, stipulated under KHK No. 595 could not function due to various reasons. What the new law required was, rearrangement of said commissions and ensuring functionality thereof. Naturally, there shall be defects in the implementation of completely new systems; however, determination and correction of said defects is what needs to be done.

5. Authorization of private companies in place of the technical officials, stipulated in the Improvement Law, non-functionality of which is already known, in order to prevent breaching the constitution is not an appropriate approach. Said application does not provide for company's autonomy and an environment of free operation. The rearrangement of the legal status shall be beneficial.
6. There is a lack of balance in terms of technical personnel distribution throughout the country in terms of both quantity and technical qualification. Thus, the pilot province application seems logical. However, it is believed that this shall lead to two separate legislations on the same issue, and complications in legal and practical terms. Moreover, it shall be re-considered which cities shall be chosen as pilot depending on their earthquake risks. In time, said application must be extended to the whole country.
7. Today, in which Turkey is struggling to become a member state of the European Union, ensuring that the construction sector and the related legislation is in compliance with the European Union norms and the world samples with the consideration of the country conditions shall also be beneficial.
8. The State lacks coordinated work with the related persons and establishments when making and implementing legal arrangements. An example of this is observed with the Law No. 4708. The Ministry has not deemed it necessary to consult with TMMOB and chambers, INTES

(Turkish Trade Union of Construction and Installation Contractor Employers), Insurance companies and other related establishments. The State must not assess said establishments with a political point of view. It is obvious that said contact must be established in order to achieve an effective and functioning system. Moreover, the same inefficiency is observed in the inclusion of persons and parties to the system. We see that TMMOB and the chambers are excluded from the system in Law No. 4708.

9. Qualifications, experience and knowledge of the technical personnel who shall be included into building inspection are important issues. Certain criteria must be established and the limits must be kept high for in order to achieve qualifications and expertise of the technician personnel. Building inspection is a service requiring maximum level of knowledge and experience. KHK 601, which has previously been enforced and abolished, is assessed in terms of this issue despite its inefficiencies. What one needs to do is to reconcile the principle of quality in the quality inspections of buildings, and to conduct actions to that effect.
10. Caution is required when determining the definition, duty and liabilities of the parties in a building inspection system. The definitions of all persons and institutes included into the system must be clear and these must be determined in an absolute manner. Moreover, it is compulsory to ensure that the parties are not subjected to conflict of interest in the distribution of duties and authorities. Assessment of both scientific and logical data in definition of the company responsibilities constitutes a prerequisite.
11. The subject of financial liability and insurance constitute the fundamental blocks of building inspection. The importance and necessity of professional liability insurances has been emphasized previously in terms securing of the financial liabilities of the parties. However, absence of the understanding of a compulsory insurance approach in Law no. 4708 causes a concern. On the other hand, it is believed that the national insurance corporation that has been established shall be useful in terms of reduction of the post-disaster

liabilities of the state and compensation of the loss to the actual beneficiary paying the premiums. An insurance system, which minimizes mistreatment with a clear scope and definition, must be included into building inspection. The national insurance companies must also prepare themselves for the building insurance concept by examination both the local and foreign models.

12. It is considered that the financial sanctions to be applied against losses occurring as a result of damage shall not be efficient after a certain point notwithstanding their level. An analogy may be drawn with that of the traffic situation in Turkey. No matter how high the fines are the desired reduction in accident, rates cannot be achieved. Not even imprisonment is dissuasive. Improvement of public conscience is very important in terms of this issue. The necessity of a robust and high quality building must be made known to every person and establishment. Losses occurring because of neglect and lack of interest are apparent. Thus, along with the increased penal provisions, the conscience raising of the public in terms of building quality must be realized starting from perhaps school age.
13. The building inspectors must receive an appropriate fee pro rata to the service rendered and liability undertaken. Said fee must be determined with the consideration of the county conditions and the legislations of other countries. It is considered that the rates stipulated in the current law, are not at required levels due to high insurance costs. Moreover, it has been observed that certain inspection firms are not acquiring insurance coverage due to lack of compulsory professional insurance in the law. Thus, it is believed that increase of the service fee rates stipulated in law by 1.0 and 1.5% shall be beneficial in terms of fulfillment of the tasks defined by the law in a worthy manner.

CHAPTER 6

CONCLUSION

It is the right of every individual to live his or her life in safe buildings of good quality. Such kind of accommodation shall merely be realized by technical, administrative and legal regulations and rules. It is from the fundamental duties of governments that these regulations, which we call building inspection, shall be formed and that every individual shall acquire the conscious of building inspection. For this reason, in forming the building inspection system and distribution of liabilities, functionality and quality shall be at the highest priority.

The systems, which have been applied until recently, were not beyond satisfying the necessities of the day. The regulations prepared in accordance with living and settlement standards of 1920s, have left behind rapidly changing social, economic and cultural identity of Turkey as the days passed. Turkey, especially after World War II, has been and is still dealing with insolvable groups of problems that grew rapidly. In this respect, only natural disasters could remind building inspection and improvement. However, in these situations covering all necessities of victims of disaster until the event would be forgot was preferred rather than finding out the defects, mistakes or excess in existent regulations. Anyway, with full agenda of economic recessions, social expansion, political crisis and disputes with other countries, time for building inspection and improvement, has never came or not desired. Days of sorrow, losses, victims and

destructions after every earthquake could keep agenda busy proportional to number of casualties, and then lost in catastrophic events pages of history one by one.

Turkish Law System has been contributing to continuance of deformity that is being experienced. Our Law System has been incapable of punishing guilty or liable real or judicial people because of their negligence, ignorance and arbitrary behavior in natural disasters, especially earthquakes. In some occasional cases on search for the guilty, our law system perceives the crime only individually. Causes of the outcomes, other people and intuitions are out of evaluation. In the mean time, necessities of people damaged by disaster are supplied followed by construction of permanent residences. Reasons for lack of quality, technical, and legal insufficiencies that cause these destructions because of disasters have not been investigated.

It is not a complicated subject to regulate building inspection and improvement systems. Nevertheless, as discussed before, political income of such regulations shall be observed in long term and shall not be witnessed in deeds in short term. This fact prevents the political decree elected for a certain period from such long-term investments. Instead, problems that shall be appreciated in that political period by voters are preferred. However, the irremediable and indifferent political allegations have been awakened by 1999 earthquakes. Because of 1999 Earthquakes, it has been comprehended that merely disaster residence construction and humane aid were not what should be done but it is the constitution of completely new building inspection system and improvement regulation. Size of damage caused the subject to be discussed, as it had never been before.

Firstly, Decree No 595 having the force of law has been put into force, which included significant progress and measures when compared with previously

applied practices despite its deficiencies. The evolutionary issues of the legislation were: the transfer of public authority to independent private organizations, supervision of inspection locally by commission formed of civil organization representatives as in most systems studied and the financial liability insurance system which was in a way a professional liability insurance.

Certainly, KHK 595 was not a perfect legislation. It included incorrect and defective statements about formation and liabilities of building inspection organization, cost of service, functionality of building inspection commissions etc. However, what had to be done was to remove the existent defects and faults in the legislation also by taking the opinions of every party in the system instead of completely abrogating. With the new arrangements, the precautions to remove the cancellation reason of Constitutional Law Court and to improve the system could be ensured.

Law no 4708, which became valid after cancellation of KHK 595, might be evaluated as a reverse step due to KHK 595 however much it includes corrections about some defective and missing issues of KHK 595. Because, by this law the status of building inspection organization has took the place of technical official in improvement law, and has been a part of a system that did not work previously. Thus, independent inspection structure has been abandoned. Moreover, it is controversial how much success would be accomplished because of performing the supervision of inspection organizations by a central government formed of bureaucrats rather than local building inspection commissions. Last, maybe the most important issue is removal financial insurance concept, which is an essential element of functional inspection system. Annulling of this practice devoted to improvement of insurance conscious and compensation of risks might be considered as an obstructing event for a well-functioning system.

On the other hand in existent legislation law no 4708, there are also indefinite and incorrect issues in the practice. These may be briefly stated as:

1. If, due to any reason, a building inspection organization will abolish its business activities, it is uncertain whom the liable is in case of a damage of a building inspected by that inspection organization in its liability period. If there were financial liability included in the system, the owner might be paid by the insurance company to compensate its damages on account of the premiums paid by the inspection organization. However, extraction of financial liability caused the compensation of damages only by DASK if the owner has insured its property. By this time, the technical staff that worked as inspector for that damaged building might be prevented to perform any further inspection work in the future.
2. It has been observed that the contractors rather than the owners are charging the inspection organizations. An owner makes a contract with the contractor to build a house for a price also including the cost of building inspection organization saying that it is the responsibility of the contractor to find an inspection organization. It is obvious that people are still considering building inspection as a legal obligation increasing the cost instead of a tool to assure and improve the quality of their buildings. In such case, the one who to be inspected becomes the employer of the inspector and it could not be realistic to state that the inspection organization would be comfortable and independent during its inspection of the contractor i.e. its employer; inspection organizations should not chase after the contractor and be focused on technical issues. To prevent this attempt, it might be offered that the Ministry will form a pool of inspection organizations. Whenever an owner needs an inspection organization, he might apply to Ministry/Local Inspection Commissions for a building inspection organization to be assigned to his building. The balance in inspection organizations' jobs in hand might be assured by the Ministry/

Local Inspection Commissions and the works shall be assigned in an order without any unfair condition.

3. In connection with the above situation, the cost of service percent declared by law is not used effectively. Namely, inspection organizations are reducing the percents to take more jobs but not performing the required level of inspection. Such organizations only sign documents and rarely perform inspections on site, which is no more than a formality. However, they are obliged to write the percent that should be due to construction period as stated in law in the building inspection contracts. Then, legally to fulfill their tax liability on fake percents, they increase their cost and use counterfeit invoices. It is rather difficult to supervise similar binary agreements between owner or contractor or inspection organizations. However, the financial data of each organization shall be inspected by legal auditors at the end of each year as a requisite report to be submitted to Ministry. By this way, meaningless invoices and expenses to fulfill the cost might be prevented.
4. In practice, one of the problems is the monthly wages of inspectors and their social securities. Today, most inspectors and assistant inspectors are working for very low wages, which is not satisfactory when compared with the importance of their duty and other models of the world. When so, they are not so willingly to perform their inspection duties and even there are many inspectors who do not go to site, which they are responsible, and they only sign the documents like the technical official in Improvement Law 3194. Moreover, social security premiums of most inspection staff are not paid by inspection organizations. To avoid such condition, the wages might be determined by joint decision of Ministry, Chamber of Commerce and Union of Building Inspection organizations every year. Accordingly, the wages might be paid to a common bank account and be paid to technical staff under control of these organizations. In addition, the Ministry shall increase their site supervisions to observe whether the inspection

organizations perform their duties. Nevertheless, central inspection commission might not be as sufficient and effective as local building inspection commissions to control all inspection organizations.

5. Some building materials testing laboratories, which perform various tests on concrete, reinforcement and other materials to be used in a construction, are also not operating properly. Likewise contractor-inspection organization relation, these laboratories are working for certain contractors and inspection organizations to continue their jobs. Nevertheless, in most cases they alter the results of tests of materials if they fail the tests. In other words, if a concrete sample should have compressive strength of 20 megapascals at the end of twenty eight days which came out to be 18 megapascals due to test, laboratories might modify it to the required value and approve the material strength. Prohibition of such action might be rather difficult, however these laboratories might be controlled frequently by related administrations. Another alternative is the university material laboratories. These tests might be performed by university laboratories to obtain the real values and to increase the income of universities so that they renovate the laboratories enhancing the quality of education. Whenever, university laboratories are not sufficient, material laboratories of public institutions most of which rarely perform material test might realize these tests.
6. In nature of the building inspection, designer and inspectors are two independent and separate parties that shall have no more relation other than technical issues. Nevertheless, today most building inspection organizations realize the design works of the buildings they inspect at the same by means of their subsidiary firms. This situation also causes a conflict interest because the inspector shall not inspect the drawings, which he has to inspect. Law that these two parties shall be distinct and have no direct or indirect relationship also forbids it. The solution might be again formation

of a designer pool by chambers of commerce and designers might be charged randomly for every project on application of owners.

7. Due to reasons said in item 4 above, technical staff of inspection organizations work for two or more inspection companies or other companies. This creates a suspicion about the quality of the inspection performed. It is also thought provoking how the Ministry realizes the supervision and approves the validity of inspections made by same technical staff under different inspection companies. On the other hand, other technical staff is working for contractors, which certainly creates a conflict of interest.
8. There is a complaint about the regulations to be applied by inspection organizations during inspection. It is claimed that the conditions of the regulations require higher standards than needed which increase the cost of the construction, especially for heat isolation regulation. Inspection organizations state that the contractors are having arguments about these issues and are not being persuaded. Due to condition described in item 2, inspection organizations are unwillingly accepting the materials used by the contractors, which might be against the regulation.
9. Another problem is that the contractors are not obliged to employ site managers for their construction. In such case, technical staff of inspection organizations could not find an authorized person to discuss and to inform about their observations. They have to deal with foreman or skilled labors which is surely not an effective way of inspection. On the other hand, it is quality of construction without a skilled site manager at least an engineer is open to discussion. Thus, required legislations have to be revised so that the existence of site managers for every work on site shall be ensured.
10. Preparation and inspection of geo-technical investigation reports for every project is one of the requisites of the current legislation. However, for multi-apartment construction projects like 10 – 20 spread on a wide land the geo-technical investigation performed on only for one apartment land is

accepted as valid for all other apartments disregarding any possible change in ground conditions in the area. This may cause significant problems especially in public housing projects and shall be revised accordingly.

11. It is a known fact that the municipalities are not so reluctant to involve in inspection mechanism, which has been considered no more than an income to municipality for years. For this reason, the problems continue with the local governments about a standard in procedures. Every municipality is requiring different documents or fees from inspection organizations, which is a confusing situation. Nevertheless, insufficient technical staff of local governments objects to applications with no mistake due to lack of information about inspection legislations. Local governments shall be informed by the Ministry and procedures, fees and documents to be required shall be standardized and be announced to local governments and public.
12. As criticized previously in this thesis, supervision of inspection organizations could not be realized by the Ministry effectively. That is why some of the problems mentioned above are in question. It is no doubt does the Ministry have adequate number and quality of staff to control the inspection organizations throughout the country. Besides, local governments, which are in charge of preparing reports for inspection organizations, are unwillingly to perform their duty claiming overloaded amount of municipal works.

Law no 4708 has been in force for approximately two years. Despite this short period, the disorder of applications in practice might be considered as warning to take counter actions. However, the main issue of this study is to examine the current legislation rather than the mistreatments in practice. For that reason, irregularities of application are only mentioned to support the inefficiency of Law no 4708.

In the light of above and previous discussions, the main issues of inspection legislation shall be outlined as follows:

1. As in all models of the world studied previously, building inspection shall be performed independently contrary to Law No 4708. Legal status of building inspection organizations shall be re-defined and the conditions against Constitution shall be removed.
2. Supervision of inspection shall be provided locally by the commissions formed of representatives of various parties similar to English Model. In Law 4708, central inspection commission shall be removed to ensure a stricter inspection maintaining continuous functionality.
3. Reliable insurance system shall be adapted to current legislation. French model, which attaches great significance to financial and professional compulsory insurance, might be modeled. Indefinite condition how and from whom the damages would be compensated shall be clearly defined in Law 4708. Defining liability period without insurance shall be abolished.
4. The uniqueness of Building Inspection, which is a combination of planning, design, construction and inspection shall be provided. All legislations shall be collected under single practice like Uniform Building Code of American System or Musterbauordnung der Bundesrepublik Deutschland of Germany.
5. Balanced distribution of liability structure shall be provided in Law No 4708 especially similar to German model. Developing such a structure shall clarify the duties and responsibilities of every party in the system that is not clear and strict in current law.
6. Main character of former inspection system, municipalities, shall be directed to intensify on their primary mission of improvement and urban planning rather than increasing their roles in the system.
7. Confusion due to presence of pilot province application shall be abolished and Law No 4708 shall be spread to all provinces regardless of geological,

social and economic condition of the regions, as it is the case in English and French Systems. To improve the inspection locally, building inspection organizations shall be encouraged to form their local offices and employ technical staff from the same region also contributing to decrease in unemployment.

8. On the way to EU, it is considered beneficial that a convenience be provided with European legislations.
9. Inclusion and role of civil society organizations in Law No 4708 shall be increased to maintain efficiency and auto-control of the system. By this way, like in English and American models, continuous improvement of the system might be achieved.
10. Due to high level of knowledge and experience requiring nature of building inspection, qualification of technical staff to be employed by inspection organizations shall be subjected to a regulation defining the prerequisites of qualification like in America and Germany. KHK 601, which was enforced and abolished with KHK 595 was a positive initial move and shall be reconsidered.
11. When compared with other models, the cost of service might be assumed to be sufficient and even a little much. However, the payment procedure of the service cost shall be modified to prevent confusions.
12. Despite severe punishments and sanctions, the essential issue is aiming to develop public conscious for well-operating system, which also might be observed as a result of the disorder in practice. This shall be assured by obligation in the shortest period by converting DASK into a compulsory format.
13. Insurance companies shall be encouraged strongly to develop and adapt themselves to inspection insurance, which was the case in KHK 595. A reasonable period might be acknowledged to them to restructure for all types of financial and professional insurance.

14. The supervision of inspection organizations shall be performed more often in a strict manner as long as the central inspection system continues. The above-mentioned problems faced during practice are mostly due to lack of superior inspection.
15. It is obvious that new arrangements have to be realized for improvement of Law No. 4708. However, assuring the coordination and adoption between every arrangement shall be crucial in order to maintain functionality and not cause any conflict of interest or legal space for mistreatment.

In conclusion, in this thesis the building inspection systems applied and are being applied are studied; on achieving this task, comparisons between various systems in the world are outlined to determine defects and mistakes of past and existent systems. With this perspective, alterations, innovations and additions for existent systems are studied and subjects to be regulated are designated. As mentioned before, KHK 595 was an evolutionary step about the inspection issue despite its all defects and mistakes whereas Law no 4708 might be considered as a return to past which was put into force to suppress public reaction. Nevertheless, at the date this thesis is being prepared, a new inspection law draft is being discussed by only Ministry since it has not been opened to public opinion. It is expected that new law will be much more beyond Law no 4708 because due to geographic and geologic conditions and the improvement culture, Building Inspection is among the most significant issues of Turkey and this concern shall continue until reaching to the best.

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APPENDIX A

ILLUSTRATIONS OF INSPECTION SYSTEMS

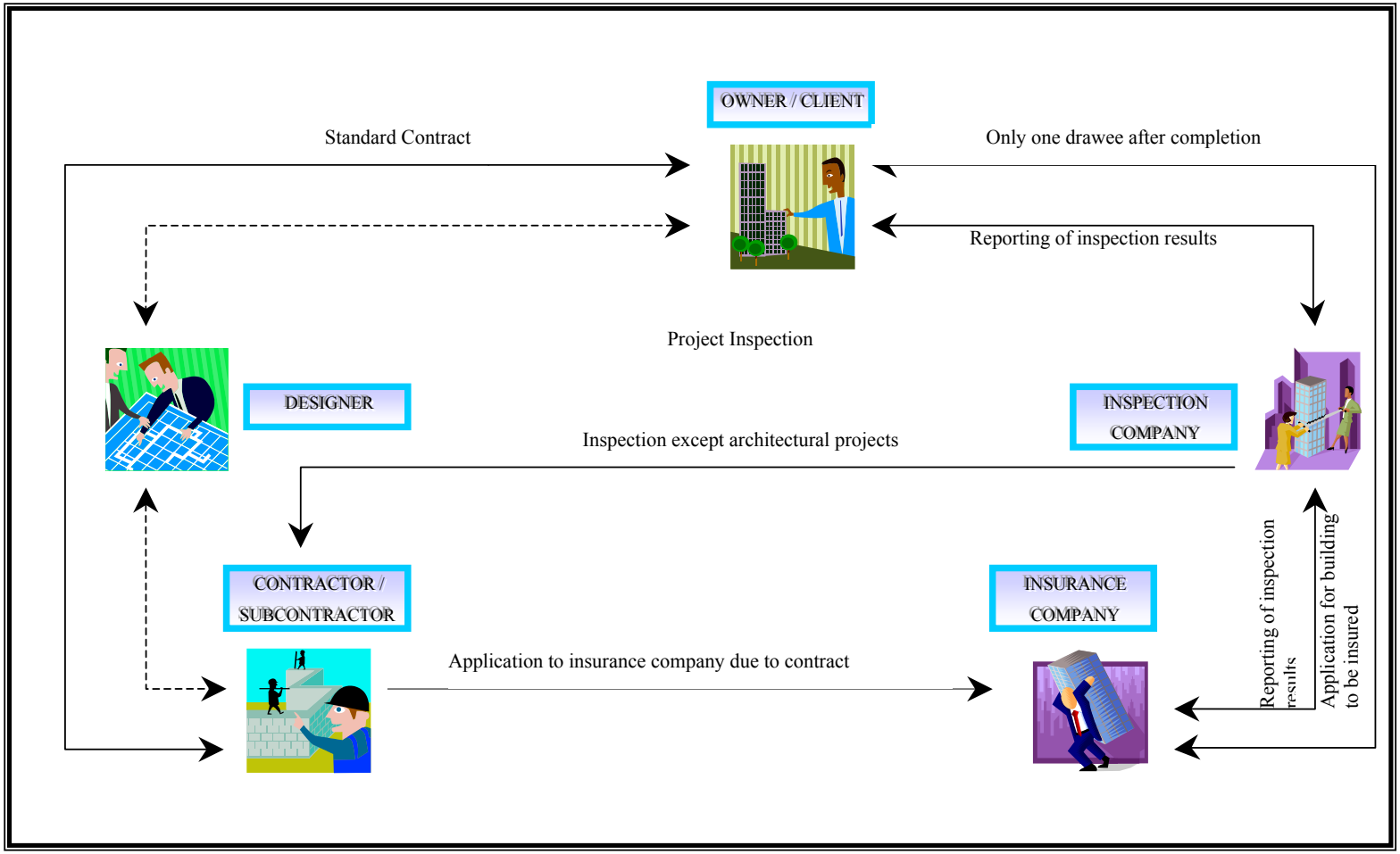

Figure A1. – Inspection Mechanism in France

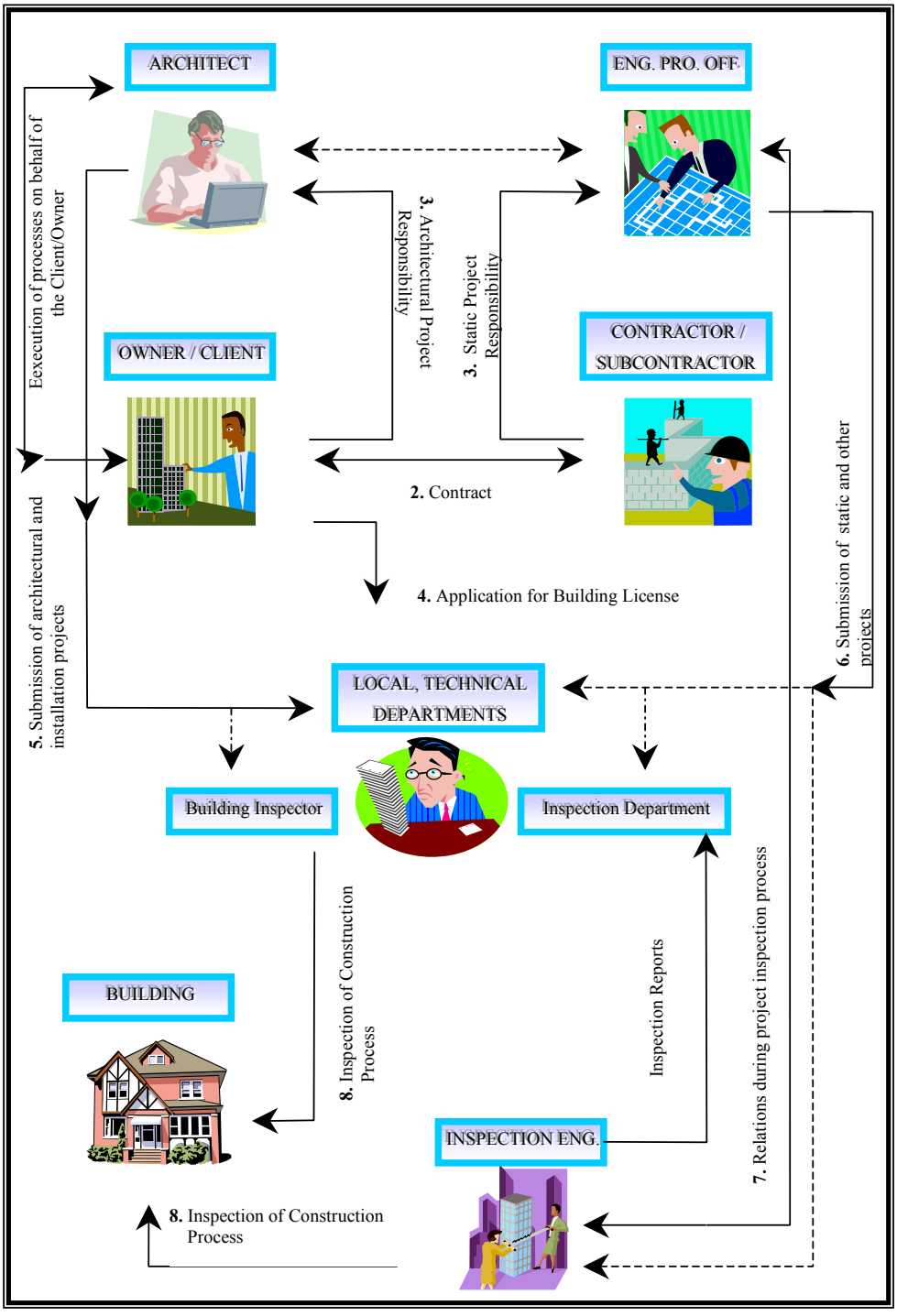

Figure A.2. Inspection Mechanism in Germany

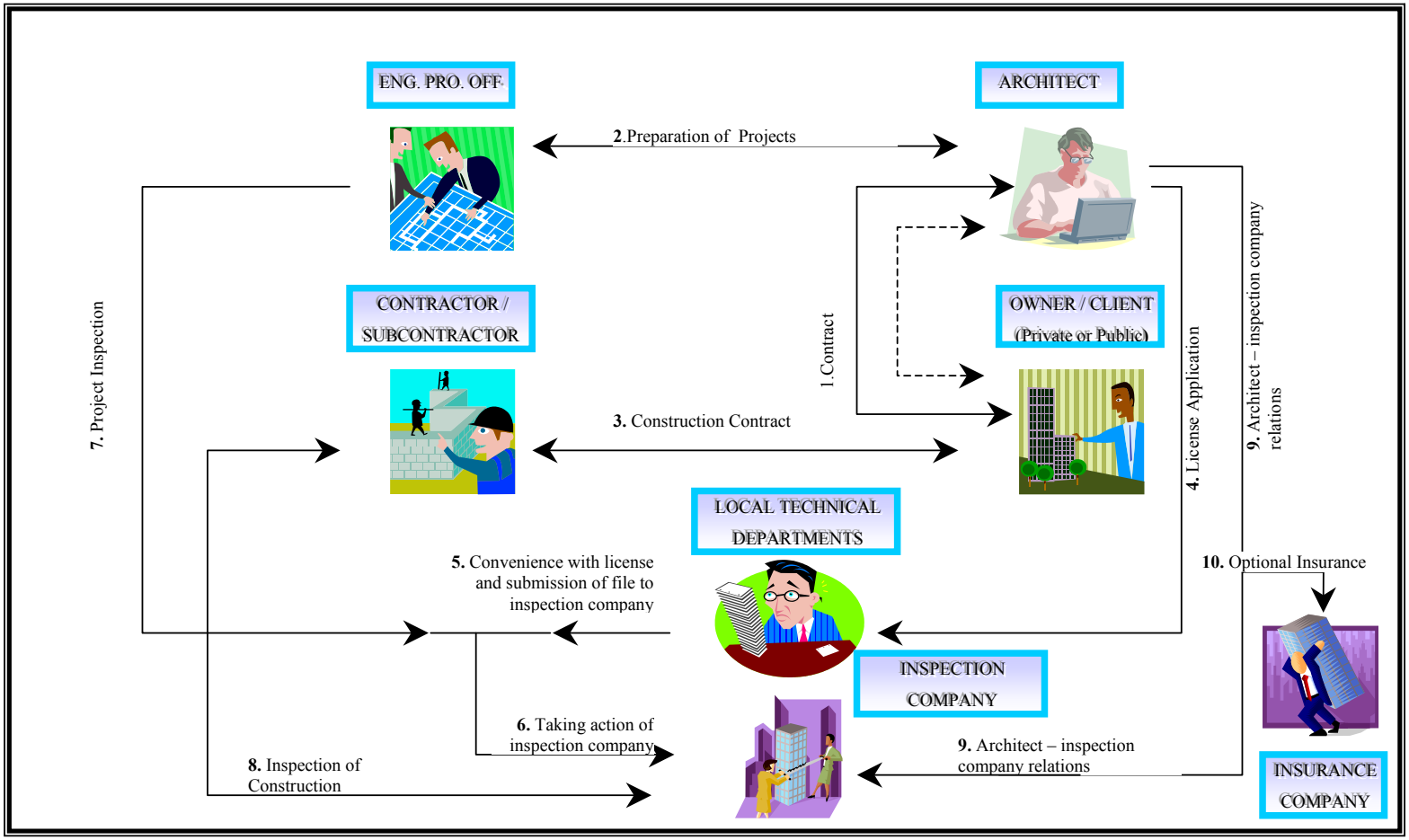

Figure A.3. Inspection Mechanism in Belgium

APPENDIX B

SUPPLEMENTARY INFORMATION RELATED TO CHAPTER 4

APPENDIX B - BUILDING INSPECTION COMMISSIONS

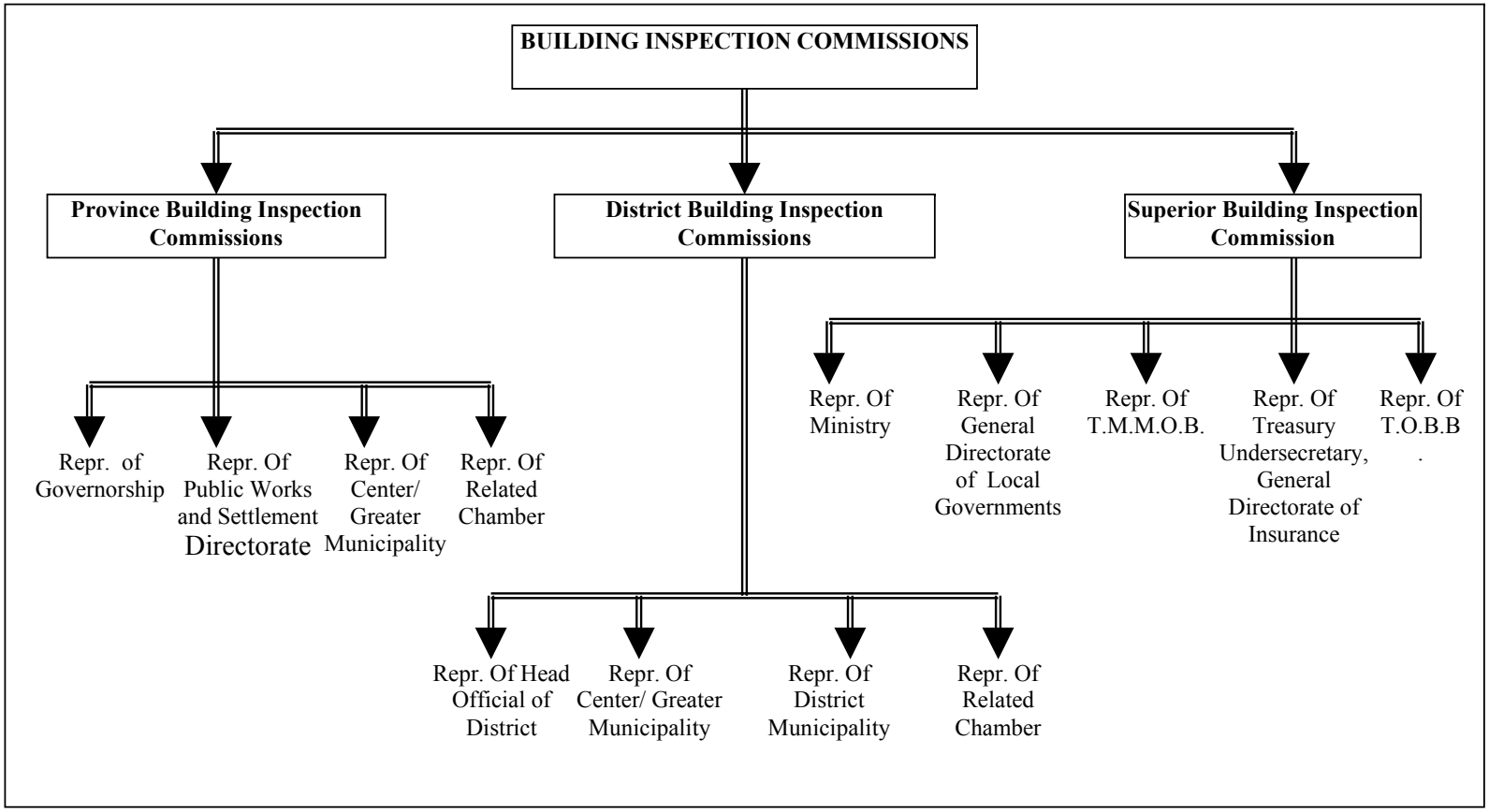

Figure B.1. Building Inspection Commissions in 595

APPENDIX B

LIST OF PROVINCES THAT DECREE NO 595 HAVING THE FORCE OF LAW IS IN FORCE

Table B.1. List of Provinces in which KHK 595 is in force

1- Adana	2- Ankara
3- Antalya	4- Aydın
5- Balıkesir	6- Bartın
7- Bolu	8- Bursa
9- Çanakkale	10- Denizli
11- Düzce	12- Eskişehir
13- Erzincan	14- Erzurum
15- Gaziantep	16- Hatay
17- İstanbul	18- İzmir
19- Kayseri	20- Kocaeli
21- Kütahya	22- Sakarya
23- Samsun	24- Tekirdağ
25- Trabzon	26- Yalova
27- Zonguldak	

APPENDIX B

LIST OF PROVINCES THAT LAW NO 4708 IS IN FORCE

Table B.2. List of Provinces in which Law No. 4708 is in force

1-	Adana	2-	Ankara
3-	Antalya	4-	Aydın
5-	Balıkesir	6-	Bolu
7-	Bursa	8-	Çanakkale
9-	Denizli	10-	Düzce
11-	Eskişehir	12-	Gaziantep
13-	Hatay	14-	İstanbul
15-	İzmir	16-	Kocaeli
17-	Sakarya	18-	Tekirdağ
19-	Yalova		

APPENDIX B

CALCULATION OF COST OF SERVICE ACCORDING TO LAW NO 4708

For the purpose of clarification, how the cost of service is calculated due to Law no 4708 will be presented in this appendix. In a typical contract agreed between owner and building inspection organization, following figures are written and stated specifically:

1. Construction area of the structure (m^2)
2. Construction Period starting from the date of signing of contract (months) to acquiring settlement permit
3. Building Unit Cost for the contract year (TL/m^2) (From annual announcement of Ministry of Public works and Housing)

Accordingly, approximate building cost shall be calculated by the below formula:

Approximate Building Cost = Construction Area X Building Unit Cost for the contract year

Then, cost of building inspection service shall be calculated as:

Cost of Building Inspection Service = Approximate Building Cost X Cost of Service Percent due to construction period (Table 4.7, Chapter 4)

Building inspection service cost shall be paid to inspection organizations by related administration depending progress reports prepared due to following basics:

Table B.3. Building Inspection Cost Installments

Part of the Structure	**Percent of Service Cost to be Paid**
Up to Sub-foundation	% 20
Structural System	% 40
Roof, non-structural walls, door and window frames, installation included ready to plaster	% 20
Rest of structure	% 20

In addition to cost of service for contract year and depending on the determination statement prepared at the end of each year, the cost of service for rest of the works shall be re-calculated with subsequent year's building unit cost and cost of service percent. Besides, if the construction period in the contract shall extend, extra % 10 of cost of service percent shall be paid for every extended six months.

Example for Cost of Inspection Service

Contractual Data:

1. Type of Structure: V. Class, D type
2. Date of contract: 26.08.2002
3. Construction Period: 24 months
4. Construction Area: 2440.71 m²
5. Unit Building Cost for Contract Year: 231.000.000 TL/m² (2002)
6. Percent of cost of inspection service: % 3.00 (table 4.7, chapter 4)

Let us assume that the building is completed up to sub-foundation on 03.10.2002 and first progress report is prepared by the inspection organization. The cost of service of inspection organization shall be:

1. Total realization percentage until 03.10.2002	20 (Table B.3)
2. Total realization percentage as of …/…/…. dated and ……no progress report	-
3. Percentage of realization for this report	20
4. Unit Building Cost for Contract Year	231.000.000 TL/m²
5. Construction Area	2440.71 m²
6. Construction Cost (4x5)	563.804.010.000 TL
7. Amount as basis for inspection service (3x6)	112.760.802.000 TL
8. Percent of cost of inspection service (extra percent when necessary)	% 3.00
9. Cost of inspection service for this report (7x8)	3.382.824.060 TL.
10. V.A.T (9x0.18)	608.908.330 TL.
11. Cost of service to be paid (9+10)	3.991.732.390 TL
12. Deductions	-
13. Amount to be paid to inspection organization	**3.991.732.390 TL**

Now, let us assume that the structural system of the building is completed on 06.02.2003. In the determination statement prepared at the end of 2002, % 24 of structural system and so % 44 of total structure is completed. This time, inspection organization shall prepare its second progress report as follows:

1. Total realization percentage until 06.02.2003	60 (20+40) (Table B.3)
2. Total realization percentage as of 0310.2002 dated and first progress report	20
3. Percentage of realization for this report (2002)	24
4. Percentage of realization for this report (2003)	16
5. Unit Building Cost for Contract Year (2002)	231.000.000 TL/m²
6. Unit Building Cost for Contract Year (2003)	300.000.000 TL/m²
7. Construction Area	2440.71 m²
8. Construction Cost (5x7) (2002)	563.804.010.000 TL
9. Construction Cost (6x7) (2003)	732.213.000.000 TL
10. Amount as basis for inspection service (3x8) (2002)	135.312.962.400 TL
11. Amount as basis for inspection service (4x9) (2003)	117.154.080.000 TL
12. Percent of cost of inspection service (extra percent when necessary)	% 3.00
13. Cost of inspection service for this report (10x12) (2002)	4.059.388.872 TL.
14. Cost of inspection service for this report (11x12) (2003)	3.514.622.400 TL
15. V.A.T ((13+14) x0.18)	1.363.322.028 TL.
16. Cost of service to be paid (13+14+15)	8.937.333.300 TL
17. Deductions	-
18. Amount to be paid to inspection organization	**8.937.333.300 TL**