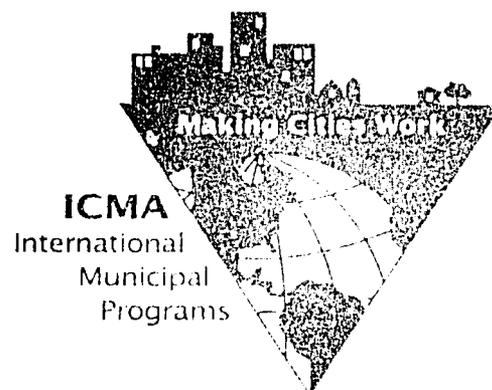


# Shelter Sector Reform Project Newly Independent States of the Former Soviet Union

An ICMA Report

Prepared for the Office of Housing and Urban Programs  
Agency for International Development



**A Building Regulatory System for Kazakhstan:  
Building Codes and Standards in a Market Economy**

**KAZAKHSTAN**

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**Prepared for the Office of Housing and Urban Programs  
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## **Abstract**

This report presents the conclusions from a technical assistance mission in Kazakhstan which took place in January of 1993. The subject of the mission was the building regulatory system, including building codes and standards, as requested by the Ministry of Construction of the Republic of Kazakhstan.

The background to Kazakhstan's construction situation is described in the beginning of the report. This description reviews the types of residential construction, the decline in activity and quality of that construction, and the changing roles of the construction industry in the Market Economy.

An exploration of the building regulations follows. This report looks at the current building requirements, perceived problems, planned Kazakhstani activity, an overview of the US system, and preliminary recommendations for improvement. The author then reviews the enforcement process in Kazakhstan. This report outlines the current enforcement process, building inspections, licensing, perceived problems, planned activities, an overview of the US system, and the author's recommendations. Sample building codes and ordinances, and a description of a typical permit process are included as attachments.

## TABLE OF CONTENTS

	Page
Executive Summary	i
I. PREFACE	1
II. INTRODUCTION	1
III. BACKGROUND	4
A. Types of Residential Construction	4
B. Decline in Construction Activity	4
C. Decline in Quality of Construction	5
D. Changing Roles in the Market Economy	6
IV. BUILDING STANDARDS AND REGULATIONS	6
A. Current Situation in Kazakhstan	6
1. Fire Safety Requirements	7
2. Seismic Design Requirements	7
B. Perceived Problems	8
C. Kazakhstani Planned Activities	8
D. Overview of System in the US	9
1. Overall Objectives	9
2. Scope of Building Codes	9
3. Model Codes	10
4. Standards and Their Relationship to the Model Codes	11
5. Code Adoption	12
6. Related Regulations and Requirements	13
E. Recommendations	14
1. Codes and Standards Formulation and Maintenance	14
2. Codes and Standards Adoption into Law	14

3.	Codes and Standards Scope and Formats	15
4.	Focus on Health, Safety and Welfare	15
5.	Revision of Specific Technical Regulations and Standards	16
V.	ENFORCEMENT	16
A.	Current Enforcement Processes for New Construction in Kazakhstan	16
1.	Plan Review	16
2.	Inspections	19
B.	Inspections of Existing Buildings in Kazakhstan	21
C.	Licensing	21
D.	Perceived Problems	22
E.	Kazakhstani Planned Activities	22
F.	Overview of System in the US	22
1.	Plan Review	23
2.	Inspections	23
G.	Recommendations	24
1.	Governmental Authority to Enforce Building Codes and Standards	24
2.	Division of Authority Between the Republic and Local Governments	25
3.	Improvement of Enforcement Procedures	25
VI.	MISCELLANEOUS OBSERVATIONS ON BUILDING TECHNOLOGY	26

- Appendices**
- A - Figures
  - B - List of Persons Interviewed
- Attachments**
- A - Table of Contents of the BOCA National Building Code
  - B - The Standards Network for Reinforced Concrete
  - C - Sample Ordinance for Adoption of the 1990 BOCA National Building Code
  - D - Article 1 - Administration and Enforcement, BOCA National Building Code
  - E - Typical Construction Permit Process

## Executive Summary

### Preface

This report covers a technical assistance mission in Kazakhstan which took place from January 11 to January 22, 1993. The subject of the technical assistance was the building regulatory system, including building codes and standards, as requested by the Ministry of Construction of the Republic of Kazakhstan.

The assignment was to gain an understanding of the building regulatory system currently in place in Kazakhstan and its shortcomings as perceived by Kazakhstani officials, to present seminars on the building regulatory system in the US, and to provide preliminary recommendations.

Meetings and interviews were conducted at the Republic level as well as the cities of Alma Ata and Karaganda. A tour of housing construction sites (multi-family and duplex) in Alma Ata was conducted by Ministry of Construction staff. A tour of housing construction sites (multi-family and single family) in Karaganda was conducted by city staff.

### Introduction

As Kazakhstan shifts from a command economy to a market economy many institutional changes are taking place. The changes most frequently discussed relate to the creation of capital markets, a banking system, an insurance industry, and the privatization of major sectors of the economy. Less mentioned, but nevertheless important, are institutional changes in the construction sector. The purpose of this report is to assist the Government of Kazakhstan in rethinking its role and the role of local governments in the building process generally, and specifically in building regulation.

The construction sector in a market economy is characterized by many different and independent participants. These include:

- Material producers
- Developers
- Contractors
- Architects/Engineers
- Owners
- Lenders
- Insurers
- Labor

The government's role in the construction process of a market economy is regulatory. The government is responsible for protecting the health, safety and welfare of individual building

users as well as of society at large as it may be affected by a building. It accomplishes this by promulgating up to date building codes and standards, enforcing these codes and standards by means of a process of competent building design review and inspection of the construction process, and establishing licensing and certification requirements for some of the key building process participants.

The various other goals of the different building process participants (economy, functionality, esthetics, technological development, and other social and political goals), goals which in a command economy are all the concern of the government, are accomplished through the play of market forces, and through the terms of contractual agreements among the various participants.

### Background

Residential construction in Kazakhstan has declined significantly since independence. This decline has resulted in the loss of profitability to many traditional product manufacturers, such as precast concrete fabricators. This has led to a search (so far unsuccessful) for foreign joint venture partners to utilize the unused industrial capacity for the production of new, and hopefully profitable products.

Everyone, at all levels of government, spoke of significant recent deterioration in the quality of construction. For the most part this is attributed to the breakdown of the command economy and shift to a market economy. In the old Soviet command economy a few large entities controlled the production of construction materials, the design and engineering of buildings, and the construction process itself. Each such entity had the staff with the necessary technical expertise or the resources to acquire such expertise. Now the government encourages many small companies to get into construction, but there is no state licensing of contractors. Technical expertise has become diluted, and even the existing organizations with technical expertise are fighting for their survival. The result is a serious deterioration of the quality of construction.

Under the Soviet command economy construction was controlled by a collegial process. A few large clients procured buildings from a few large contractors with the help of a few large architectural/engineering institutions. All of them were entities of the government and all of them, including the clients, had on board technical expertise. In this context, the Ministry of Construction and the applicable municipal departments (Chief Architects) provided the ultimate technical expertise, more as mediators than regulators.

Under the market economy, with its potential for creating an adversarial construction process, the traditional roles have

become ambiguous. In particular, there is no legal or administrative basis for the exercise of technical expertise in a regulatory capacity. Thus, the building process in Kazakhstan today is characterized not by an absence of expertise, but by the absence of a structure for its effective utilization.

## Recommendations Related to Building Standards and Regulations

### 1. Codes and Standards Formulation and Maintenance

The Ministry of Construction might consider modifying the way in which codes and standards are written to include representation from the variety of private interests (building materials producers, contractors, small homebuilders and remodelers, etc.), as they become established and organized. These procedures could include the use of advisory groups and public hearings at which comments on codes and standards being developed would be solicited from private groups. While the Oblast and municipal levels of government should also be represented in the process, codes and standards should continue to be written, and revised over time, at the republic level, and should be uniform throughout the country. Regional differences in codes and standards will pose a barrier to private firms trying to introduce innovative building products and methods of construction. It is also more economical to carry out this activity at a central location, and to avoid the redundancy of codes and standards development at different levels of government.

### 2. Codes and Standards Adoption into Law

The Ministry of Construction should consider the legal changes at the republic level which would give the codes the force of law to regulate private and public construction. Thought could also be given to the development and use of a relatively standardized adoption ordinance or decree at the local level, similar to the model adoption ordinance included in Attachment C.

### 3. Codes and Standards Scope and Formats

The Ministry of Construction may wish to change the scope and formats of its standards and regulations to distinguish more clearly between

- codes to be used for the regulation of construction, and
- standards to be used for a wide variety of regulatory and contractual purposes in building materials production, and building design and construction.

In defining the scope and formats of codes and standards, the goals of convenience and efficiency to their users who are engaged in design and construction should be achieved.

4. Focus on Health, Safety and Welfare

The Ministry of Construction is attempting to define the authority and scope of building regulation by the Republic and local governments under the evolving market economy, and it may adopt a focus on health, safety and welfare.

The Ministry of Construction may wish to consider the revisions of current regulations and standards in light of this focus and eliminate those aspects of the current regulations which can be left to private contractual agreements and to market forces, without endangering the health, safety and welfare of the public.

5. Revision of Specific Technical Regulations and Standards

Kazakhstan is undertaking a comprehensive revision of all its building regulations and standards. The necessary expertise and procedures for this undertaking exist in Kazakhstan.

The Ministry of Construction should integrate its actions related to the preceding Recommendations 1, 3 and 4 into its ongoing technical revision activities. In light of current efforts to achieve greater uniformity in international standards, the Ministry may wish to compare current regulations and standards with specific US or other foreign counterparts. The revision of specific regulations and standards should achieve cost-effective levels of performance, as well as feasibility of enforcement.

Recommendations Related to Enforcement

1. Governmental Authority to Enforce Building Codes and Standards

Article 1 ADMINISTRATION AND ENFORCEMENT of the BOCA National Building Code/1990 was translated into Russian and handed out to all seminar attendees.

The Ministry of Construction may find that Article 1 of the BOCA Code provides a useful outline or framework for the establishment of governmental authority to enforce codes and standards, and may wish to use it in developing its own administrative and enforcement provisions, which will incorporate actions taken in accordance with the following Recommendations 2 and 3.

## 2. Division of Authority Between the Republic and Local Governments

In order to arrive at a definition of the division of authority between the Republic and local governments, the Ministry of Construction should observe the general rule that it is advisable to place enforcement activities at the local level where they are readily accessible to the users (owners, developers, designers and builders). At the same time, the enforcement entity should have the complete range of necessary expertise. These two factors should determine the divisions of governmental enforcement. For example, in rural areas enforcement may be better served at the Oblast rather than the municipal level.

## 3. Improvement of Enforcement Procedures

The Ministry of Construction and/or other appropriate levels of government should establish well defined code enforcement inspection procedures. These should include site visits related to specific phases of construction as well as a final inspection upon completion of the project. The procedures should be based on a clear understanding of the applicable regulatory authority, the legal remedies available to the enforcement agency, and a commitment to the protection of the public health and safety. Initially, the procedures should focus on specific problem areas currently identified as contributing to defective construction.

## I. PREFACE

This report covers a technical assistance mission in Kazakhstan which took place from January 11 to January 22, 1993. The subject of the technical assistance was the building regulatory system, including building codes and standards, as requested by the Ministry of Construction of the Republic of Kazakhstan.

The assignment was to gain an understanding of the building regulatory system currently in place in Kazakhstan and its shortcomings as perceived by Kazakhstani officials, to present seminars on the building regulatory system in the US, and to provide preliminary recommendations.

Meetings and interviews were conducted at the Republic level as well as the cities of Alma Ata and Karaganda. Most of the meetings at the Republic level were conducted at the Ministry of Construction with Mr. Bair Dosmagambetov, Chief Architect and Deputy Chairman of the State Architecture and Building Committee, and the heads of his departments on standards, technical expertise (project review), and control (inspections). Meetings were also conducted with a member of the Fire Service in the Department of Interior, and with two members of the Kazakh Research and Experimental Design Institute on Earthquake Engineering and Architecture. A tour of housing construction sites (multi-family and duplex) was conducted by the Ministry staff. A meeting in Alma Ata was conducted with the Chief of the Building, Improvement and Extraordinary Situations Department. Meetings in Karaganda were conducted with the Deputy Mayor for Construction, the Chief Architect and his staff. A tour of housing construction sites (multi-family and single family) was conducted by city staff.

Finally, a trip to Issik, a small town about 60 km northeast of Alma Ata, was taken at the invitation of Mr. Dosmagambetov. Meetings were held with the mayor of Issik and with the regional administrator.

## II. INTRODUCTION

As Kazakhstan shifts from a command economy to a market economy many institutional changes are taking place. The changes most frequently discussed relate to the creation of capital markets, a banking system, an insurance industry, and the privatization of major sectors of the economy. Less mentioned, but nevertheless important, are institutional changes in the construction sector. The purpose of this report is to assist the Government of Kazakhstan in rethinking its role and the role of regional and local governments in the building process generally, and specifically in building regulation.

Under the Soviet command economy the government had a central role in the production of buildings. Under that system construction was controlled by a collegial process. A few large clients procured buildings from a few large contractors and material producers, with the help of a few large architectural/engineering institutions. All of them were entities of the government and all of them, including the clients, had on board technical expertise. In this context, the Ministry of Construction and the applicable municipal departments (Chief Architects) provided the ultimate technical expertise, more as mediators than regulators. All the participants in this process cooperated to achieve several goals in the building process. These included health, safety and welfare of building users and society at large, economy, functionality of the building, esthetics, technological development, and other social and political goals

By contrast, the construction sector in a market economy is characterized by many different and independent participants. These include:

- Material producers----These may range from small, highly specialized manufacturers, to large multi-national corporations for which building materials are merely one of a large variety of products (e.g., the chemical industry). They may produce anything from a single component or finish material to a complete prefabricated building.
- Developers----These undertake the risk of building production and manage the total process. They may range from large companies developing multiple projects to partnerships created for the purpose of developing a single project.
- Contractors----These undertake the physical erection of the entire building or parts of it.
- Architects/Engineers----These are responsible for the planning and design of the buildings. They range from independent entities working for the developer to divisions of the contractors.
- Owners----These own and use the entire building or portions of it. They range from individuals who buy apartments from a developer to large companies who need a building for their own use.
- Lenders----These provide the financial resources to some or all of the other participants.

- Insurers----These assume some or all of the risks undertaken by some or all of the other participants.
- Labor----These are the employees of the other participants, primarily the material producers and the contractors, who physically assemble and erect the building.

With many independent participants, each with its own interests and goals, the construction process in a market economy has the potential of being an adversarial process.

The government's role in the construction process of a market economy is regulatory. The government is responsible for protecting the health, safety and welfare of individual building users as well as of society at large as it may be affected by a building. It accomplishes this by promulgating up to date building codes and standards, enforcing these codes and standards by means of a process of competent building design review and inspection of the construction process, and establishing licensing and certification requirements for some of the key building process participants. While carrying out this regulatory function, the government strives to maintain several overall objectives for the operation of the building process. These are:

- A maximum of flexibility and choice for the users of buildings.
- A large variety of offered products.
- Removal of constraints to innovation in products and processes.

The government's regulatory role can be carried out by different levels of government----national, regional or local----with the allocation of responsibility intended to optimize the accomplishment of these objectives. Some roles benefit from private sector participation. Later in this report the US system of allocating responsibility for the various building regulatory activities will be described.

The various other goals of the different building process participants (economy, functionality, esthetics, technological development, and other social and political goals), goals which in a command economy are all the concern of the government, are accomplished through the play of market forces, and through the terms of contractual agreements among the various participants.

### III. BACKGROUND

#### A. TYPES OF RESIDENTIAL CONSTRUCTION

Residential construction in the former Soviet Union has been characterized by large multifamily developments in mid-rise and high-rise buildings since the Khrushchev policy of accelerated housing construction. Large sites of several hundred to several thousand apartments are typical in the cities, and can be seen throughout Alma Ata and Karaganda (Figure 1). While Alma Ata is also characterized by many neighborhoods of older, possibly pre-revolutionary, one- and two-story single family houses, some of these neighborhoods located in areas of multifamily project development are reportedly scheduled for demolition (Figure 2).

At the same time, lower density projects----duplexes in Alma Ata (Figure 3) and single family in Karaganda (Figures 4, 5 and 6) were visited ----are being developed. In 1992 the city built 968 apartments and 89 single family houses in Karaganda. These numbers apparently do not include private single family houses, of which 1,000 units are reportedly under construction on one site. In Karaganda the stated policy for 1993 is to reduce the number of apartment buildings in order to create more single family houses. Similar numbers were not available for Alma Ata.

Multifamily buildings have generally been constructed of precast concrete panels (walls and floors), which is considered the fastest way to build. Currently 7-10% of multifamily buildings in Alma Ata are of "monolithic" construction, characterized by cast-in-place concrete walls and precast concrete floor panels and stairs. Steel forms and ready-mix concrete are being used for the walls (Figures 7 and 8).

Exterior precast concrete panels generally come with integral thermal insulation, but approximately 50-60 cm thick uninsulated exterior masonry walls were also observed in both high rise (Figure 9) and low rise (Figure 10) buildings.

Single family houses and duplexes are generally of masonry walls (brick or hollow clay tile), precast concrete floors, and wood truss roofs covered with tile or corrugated metal.

Interior walls and partitions are generally papered (Figure 11). Floors are usually covered with linoleum or wood parquet, with attention paid to controlling impact noise. Windows and doors are wood (Figure 12). Double windows are used for thermal insulation. Apartment heating is accomplished by radiators. Electricity in new apartments is individually metered.

#### B. DECLINE IN CONSTRUCTION ACTIVITY

Residential construction in Kazakhstan has declined significantly since independence. A precast concrete panel factory in Alma Ata, which produced about 500,000 sq. m. of

apartments in the mid-1980s, now produces 100,000-200,000. The city of Karaganda built about 300,000 sq. m. of apartments in 1991. In 1992 this was down to 154,000.

This decline in residential construction has resulted in the loss of profitability to many traditional product manufacturers, such as precast concrete fabricators. This has led to a search (so far unsuccessful) for foreign joint venture partners to utilize the unused industrial capacity for the production of new, and hopefully profitable products.

#### C. DECLINE IN QUALITY OF CONSTRUCTION

While some Ministry of Construction personnel stated that the quality of both interior and exterior finishes in Soviet construction had always been lower than that in the West, everyone, at all levels of government, spoke of significant recent deterioration in the quality of construction. For the most part this is attributed to the breakdown of the command economy and shift to a market economy, although the Chief of Building in Alma Ata stated that many problems, such as a weak materials base, obsolete masonry factories, and poor quality concrete, existed even before.

In the old Soviet command economy a few large entities controlled the production of construction materials, the design and engineering of buildings, and the construction process itself. Each such entity had the staff with the necessary technical expertise or the resources to acquire such expertise. Now the government encourages many small companies to get into construction, but there is no state licensing of contractors. Technical expertise has become diluted, and even the existing organizations with technical expertise are fighting for their survival. The result is a serious deterioration of the quality of construction.

Mr. Dosmagambetov reported that it is estimated that in 1992 85-90% of construction did not meet current standards. He attributed this to three causes:

- Absence of competition.
- Inappropriate technology.
- Shortages of materials and resultant high costs.

Mr. Jumashev, Director of the Ministry of Construction's Department of Control (Republic Architecture and Construction Inspection), reported that in the 1960s there were about 18-24 structural failures per year in Kazakhstan. There was a noticeable improvement in the mid-1980s, with only one or two failures. Now there is once again serious concern in his department about structural failure, especially in the event of an earthquake.

#### D. CHANGING ROLES IN THE MARKET ECONOMY

With the shift from a command to a market economy the traditional roles of the various governmental entities have become ambiguous. In particular, there is no legal or administrative basis for the exercise of technical expertise in a regulatory capacity. Thus, the building process in Kazakhstan today is characterized not by an absence of expertise, but by the absence of a structure for its effective utilization.

#### IV. BUILDING STANDARDS AND REGULATIONS

##### A. CURRENT SITUATION IN KAZAKHSTAN

There are two categories of documents which regulated construction in the former Soviet Union. The first are standards for materials and systems, referred to as "norms", or "gost" in Russian. As in the US, there are hundreds of such documents.

The second category of documents is construction regulations and rules. These are organized into separate documents by building occupancy category (e.g., housing, public assembly, etc.). They reportedly include design and construction criteria which go beyond health, safety and welfare (which define the scope of building code criteria in the US) to include functionality, operability, economy, aesthetics, etc. Thus, these construction regulations and rules can be compared to a combination of building code requirements, underwriting standards (such as the former HUD Minimum Property Standards), and owners' program requirements (such as documents developed by Marriott Hotels or Holiday Inns).

Neither category of documents was characterized as being laws. Rather, these documents have been used to control construction transactions between large government entities, and were probably referred to in applicable contract clauses. There is no single document analogous to an American building code in use in the former Soviet Union.

Both categories of documents were promulgated by the central Soviet Government. The construction regulations and rules could, apparently, be modified locally to some extent. For example, the Chief Architect of Karaganda stated that Karaganda allowed or required parking adjacent to residential buildings when the Soviet criteria forbade it. Furthermore, certain changes were made as local responses to complaints. The scope of such local changes, however, was probably limited.

In the past these documents were reviewed every five years. However, some of the documents shown us at the Ministry of Construction were dated 1980, and both categories of documents were described as being in need of updating.

There is a Department of Standards in the Ministry of Construction of Kazakhstan. It has eight employees, and while its role under the former Soviet system was not discussed, today its job is to manage and administer the standards development process. This role is clearly defined in a recent document developed by the Ministry, which also defines the standards development process. The Department of Standards assigns particular standards development to particular institutes with the appropriate expertise. It receives and reviews the drafts, and sends them out for additional reviews to entities such as contractors and manufacturers. For example, the review of a concrete panel standard might be done by 10 producers, 10 contractors, and about five more from various design institutes, the Ministry of Ecology and the Ministry of Health Care. After review, the standard is approved by a committee (collegium) of the Ministry of Construction. This collegium consists of the chiefs of all 16 departments of the ministry, and four administrators. Nine of the 20 can vote on approval of the standard. There is a similar process for the development of special technical requirements by specific ministries. The standard development process reportedly takes 6-12 months.

Specific standards were not analyzed, but the standards in two technical areas----fire safety and seismic design----were discussed in meetings with specialists.

#### 1. Fire Safety Requirements

There are fire safety requirements included in each of the construction regulations and rules documents (which are organized by occupancy category). Fire safety requirements reportedly constitute approximately 75% of the requirements in the document on public buildings. Additionally, there is a separate book of general fire safety requirements, such as hydrants, parking, egress, stairs, etc.

Currently the fire safety requirements include building separation and related window area limitations, fire resistance of separations (of which there are five classes), flame spread of surfaces in means of egress, egress requirements, special requirements for buildings of 10 or more floors, alarm systems, and automatic sprinklers (required in "public buildings" and in large stores, and under consideration in multi-family residential means of egress).

Under the USSR the Fire Safety Institute participated in the standards development process. Now there is a Fire Research Laboratory under the Fire Service of the Interior Ministry which will be responsible for fire safety standard development.

#### 2. Seismic Design Requirements

Kazakhstan has five seismic zones, of which the highest, rated 9 on their damage severity scale, is the Alma Ata region.

In the former Soviet Union only Kamchatka, in northeastern Siberia, is rated higher.

The current seismic design requirements in the construction regulations and rules are dated 1980. Stricter requirements were developed for Alma Ata in 1983. Both are considered out of date.

New requirements are being developed by the Kazakh Research and Experimental Design Institute on Earthquake Engineering and Architecture. The technical aspects are reportedly very strong, with criteria equal to or greater than those in the US.

B. PERCEIVED PROBLEMS

Mr. Dosmagambetov stated categorically that building standards in the former Soviet Union were lower than standards in the West. This was echoed relative to fire safety standards by Mr. Aitmuchambetov, Chief Specialist of the Fire Service in the Interior Ministry.

Everyone interviewed seemed to agree that all the standards were in need of updating.

C. KAZAKHSTANI PLANNED ACTIVITIES

Mr. Dosmagambetov stated that Kazakhstan, wishing to join the international community of nations, would like to move away from the current inherited Soviet building standards, and to develop its own set of building standards and regulations. The Ministry of Construction has recently produced a 17-page document of needed regulations for the Republic.

The objective of this undertaking is to put in place a complete system of building regulations which will allow construction to take place at the Oblat and city levels. It should be something new, not merely cosmetic adjustments to the current system.

Some activities have already started. The Fire Research Laboratory, under the Fire Service of the Interior Ministry, has a contract from the Ministry of Construction to develop a single fire safety requirements document for all building categories. This document should be ready in mid-1993, and will be subject to review by a broad spectrum of users.

New revisions to the seismic design requirements are being developed by the Kazakh Research and Experimental Design Institute on Earthquake Engineering and Architecture. They are currently working on a new code for Alma Ata, and by 1994---for the Republic.

There may be other ongoing activities about which we have no information.

## D. OVERVIEW OF SYSTEM IN THE US

### 1. Overall Objectives

Building codes and standards in the US, and the process of their development, form a complex system, which has evolved so as to achieve several objectives:

- Nationwide uniformity, while retaining legitimate regional differences and the individual jurisdiction of the 50 states. This objective is intended to encourage product development, innovation and competition, by reducing regional market barriers.
- Consensus of participants, while giving everyone an opportunity to be heard.
- High level of professional and technical input.
- Currency (i.e., being up to date).
- Economy in the process of developing codes and standards.
- Reasonable economic impact.

### 2. Scope of Building Codes

Building codes in the US contain all the design and construction requirements necessary to assure the health, safety and welfare of building occupants and of society at large as it is affected by a building for all common building types (occupancy categories). Building codes also contain specific references to all the standards which must be used to ascertain that the code requirements are complied with.

Building codes can be in a single document, or in several related documents. Often one finds a building code, a plumbing code, a mechanical code, and an electrical code.

Building code requirements generally apply to new building construction. In existing buildings, they only apply in the case of renovation or change of occupancy category.

Building code requirements are a combination of both performance and prescriptive requirements. The former define a performance goal and all solution shown to meet that goal are acceptable. The latter define specific acceptable solutions. Performance requirements generally encourage innovation, but are usually more complicated to enforce.

### 3. Model Codes

There are three families of model codes which are developed and maintained by three model code organizations:

- Building Officials and Code Administrators (BOCA) International----the BOCA National Codes.
- Southern Building Code Congress International (SBCCI) ----the Standard Codes.
- International Conference of Building Officials (ICBO) ----the Uniform Codes.

Each of the model code organizations is a professional association of building regulatory officials. They are generally regional in nature, with BOCA covering primarily the northeast and central US, SBCCI covering the south, and ICBO covering the west.

The model code organizations' principal activity is the publication and maintenance of the model codes, and their main source of income is the sale of the code documents. Individual code documents cost about \$30-50. A complete set of the SBCCI model codes (five volumes) costs \$129.50 to members and \$195.00 to non-members. Other activities of the model code organizations include the development of training materials and programs, testing and certification of regulatory officials, publication of various guidance documents, and an evaluation service for innovative products.

The model codes are published every three years, and a supplement including additions, changes and amendments is published annually. Anyone may prepare and submit a proposed change to the model codes. Usually such changes are proposed by various professional or trade associations, individual building process participants, code enforcement officials and/or their respective governments (state or local), members of the fire services, agencies of the Federal government (usually involving issues of broad national interest, such as energy conservation, building in flood plains, seismic safety, etc.), and the staffs of the model code organizations. These proposed changes are printed by the model code organizations, circulated, and argued at code change committee hearings which are held once a year. The respective code change committee votes on each proposed code change, recommending approval, amendment or rejection. These committee recommendations are taken up at a later annual meeting of the model code organization's membership, and are accepted or rejected by simple vote.

While the three model codes cover the same technical scope and subject matter, there are differences in both format and substance between them. (Attachment A is the Table of Contents

of the BOCA National Building Code/1990. The respective tables of content of the other two model codes are different.) These differences exist for various historic reasons, and some of them reflect regional differences. There is a current effort under way to develop and adopt a uniform format for all three model codes. Code changes are currently being proposed to accomplish this.

The three model code organizations have established an institutional framework for joint action. They have collaborated to produce a single document entitled One and Two Family Dwelling Code, which is a set of prescriptive requirements for simple residential construction, and a Model Energy Code.

#### 4. Standards and their Relationship to the Model Codes

A standard is a document containing a definite rule or measure which is utilized as a basis for judging quality or quantity. The building code contains criteria for quality and quantity, and the standards define how that quality or quantity is to be measured. There are three categories of standards related to building codes:

- Engineering Practice (methods of design, fabrication, and construction)
- Material Standards (specifications of quality and physical properties of materials or manufactured products)
- Test Standards (methods of measurement or verification)

The BOCA National Building Code/1990 contains specific references to 285 standards. Many of these standards contain references to additional standards. One can think of these as a hierarchical network. Attachment B is a table showing part of the network of standards for reinforced concrete referenced in the BOCA National Building Code.

This method of referencing standards separates the standards text from the code text. This simplifies the code, and allows the independent development of the standards by specialized experts. Also, the principal users of the building code, building designers and regulatory officials, do not usually require direct access to most of the standards.

It should be noted that while the scope of building codes is limited to health, safety and welfare, the scope of standards is often much broader. For example, a standard for windows may be referenced in the building code for issues such as the safety of the glass, energy conservation, light and ventilation. The same window standard may also address other measures of quality of importance to users, such as ease of operation, durability, and

esthetics. Thus, the building code referencing must be specific and precise.

Building-related standards in the US are developed and promulgated by a large number of professional and trade associations. A few are developed by Federal agencies, such as the Consumer Product Safety Commission (CPSC) and the National Institute of Standards and Technology (NIST). For example, the 285 standards referenced in the BOCA code were developed by 43 organizations. Standards relating to fire safety in buildings are developed by the National Fire Protection Association (NFPA), which includes active participation of members of the fire services among many others (product manufacturers, architects and engineers, etc.).

In order to encourage their acceptance, adoption and use, standards are developed in a process referred to as a "consensus process", and designed to incorporate the broadest possible inputs. In general, the organizations which develop standards are large organizations with broad membership. They are structured into technical committees and subcommittees. The development or revision (most standards are revised every few years) of a particular standard is assigned to an appropriate subcommittee, which creates a task group of experts and interested parties who work on drafting the standard. Drafts are circulated to all subcommittee members for a vote. Each negative vote must be accompanied by a written explanation, and the task group must respond to the negative vote by modifying the draft, or developing a written finding that the vote is not persuasive. This process is repeated until there are no more negative subcommittee votes. The process is then repeated at the committee level, and subsequently, at the full organization level. Finally, a public announcement of the draft standard is made, and comments are invited from the general public. Only after this process, is the draft standard published as a standard by the respective organization.

The standards system in the US is often referred to as a voluntary system. This is because the standards have no official or legal status until they are referenced in a contract, or adopted into law as part of the legal adoption of a model code (or other code) by a governmental jurisdiction.

##### 5. Code Adoption

Building codes in the US are adopted into law by a state or local ordinance. This adoption must be consistent with the respective constitution and jurisdictional legal framework. Approximately one half of the states have adopted statewide preemptive building codes, while the rest of the states leave building code adoption entirely up to local jurisdictions. There are different scopes of application of building codes adopted by the states, such as:

- A class of buildings, such as all state-owned buildings.
- A class of buildings based on construction method, such as manufactured buildings.
- All except small residential buildings.
- A specific aspect of construction, such as fire safety.
- All buildings.

In the past many jurisdictions used locally developed building codes, and a few states and local jurisdictions continue to do so. However, it is uneconomical and not easy to maintain such codes up to date. Furthermore, locally developed codes constrain product innovation by necessitating multiple local negotiations of code acceptance for innovative products. Currently most states and local jurisdictions adopt a more or less recent edition of one of the three model codes. This has led to a higher degree of uniformity throughout the country, to a unified market for building products and systems, and to a more economical way of keeping the codes up to date.

Some jurisdictions adopt a model code with specific modifications, while others adopt them unamended. Attachment C is a sample ordinance for adoption of the 1990 BOCA National Building Code.

#### 6. Related Regulations and Requirements

Building codes in the US regulate the health, safety and welfare aspects of building design and construction. There are additional regulations adopted by state or local governments which impact building design and construction. In general these are contained in zoning ordinances and subdivision regulations, which address aspects of the land, its use, and the physical context of the building. These regulations affect functional, aesthetic, safety and other aspect of buildings in various ways, such as:

- Allowed and non-allowed uses.
- Permitted height and site coverage.
- Front, side and rear setback requirements.
- Materials, colors and other architectural requirements.
- Landscaping requirements.
- Parking requirements.

Finally, other non-governmental participants in the building process may impose additional standards and requirements on a project. Lending institutions and insurers frequently establish such requirements, which sometimes are stricter, or cover other aspects of a building, than building codes.

## E. RECOMMENDATIONS

### 1. Codes and Standards Formulation and Maintenance

As discussed above, codes and standards in the US are written, and periodically revised, by a variety of private non-profit organizations which are supported by various groups that have an interest in the specific standards or the codes as a whole. In Kazakhstan, the standards for materials and systems, and the building regulations and rules currently in use have been developed and used in the collegial building process of the command economy, in which all the participants are government entities. The types of private organizations active in the US in codes and standards writing and maintenance are unlikely to emerge in Kazakhstan until a relatively complete transition to a market economy been achieved, and active private building materials and construction industries have become firmly established. Thus, at least during the transition period ahead, the government is likely to keep responsibility for the development of codes and standards.

The Ministry of Construction might consider modifying the way in which codes and standards are written to include representation from the variety of private interests (building materials producers, contractors, small homebuilders and remodelers, etc.), as they become established and organized. These procedures could include the use of advisory groups and public hearings at which comments on codes and standards being developed would be solicited from private groups. While the Oblast and municipal levels of government should also be represented in the process, codes and standards should continue to be written, and revised over time, at the republic level, and should be uniform throughout the country. Regional differences in codes and standards will pose a barrier to private firms trying to introduce innovative building products and methods of construction. It is also more economical to carry out this activity at a central location, and to avoid the redundancy of codes and standards development at different levels of government.

### 2. Codes and Standards Adoption into Law

The standards for materials and systems, and the building regulations and rules currently in use in Kazakhstan apparently do not have the legal status for use as regulatory documents in a market economy.

The Ministry of Construction should consider the legal changes at the republic level which would give the codes the force of law to regulate private and public construction. Thought could also be given to the development and use of a relatively standardized adoption ordinance or decree at the local level, similar to the model adoption ordinance included in Attachment C.

### 3. Codes and Standards Scope and Formats

In the US the building codes contain the requirements applicable to health, safety and welfare of buildings and their users. The standards referenced in the building codes, while their scope may go well beyond health, safety and welfare (e.g., durability, esthetics etc.), contain all the information needed to measure and ascertain compliance with the code requirements. In Kazakhstan, the two sets of standards and regulation documents which govern construction are organized differently.

Personnel of both the Republic and city levels who attended seminars on the US building regulatory system expressed interest in the scope and formats of US building codes and standards. The Table of Contents of the BOCA National Building Code/1990 (Attachment A) was translated into Russian and distributed to all seminar attendees. A copy of that code, and of the CABO One and Two Family Dwelling Code, 1992 edition, were left with the Ministry of Construction.

The Ministry of Construction may wish to change the scope and formats of its standards and regulations to distinguish more clearly between

- codes to be used for the regulation of construction, and
- standards to be used for a wide variety of regulatory and contractual purposes in building materials production, and building design and construction.

In defining the scope and formats of codes and standards, the goals of convenience and efficiency to their users who are engaged in design and construction should be achieved.

### 4. Focus on Health, Safety and Welfare

Building codes and standards must clearly relate to the regulatory system which uses them. In the US the building regulatory system is limited to the assurance of health, safety and welfare. The scope of building regulations and standards in the former Soviet system was considerably broader, as noted above. The Ministry of Construction is attempting to define the authority and scope of building regulation by the Republic and local governments under the evolving market economy, and it may adopt a focus on health, safety and welfare.

The Ministry of Construction may wish to consider the revisions of current regulations and standards in light of this focus and eliminate those aspects of the current regulations which can be left to private contractual agreements and to market forces, without endangering the health, safety and welfare of the public.

5. Revision of Specific Technical Regulations and Standards

Kazakhstan is undertaking a comprehensive revision of all its building regulations and standards. The necessary expertise and procedures for this undertaking exist within the various institutions of Kazakhstan.

The Ministry of Construction should integrate its actions related to the preceding Recommendations 1, 3 and 4 into its ongoing technical revision activities. In light of current efforts to achieve greater uniformity in international standards, the Ministry may wish to compare current regulations and standards with specific US or other foreign counterparts. The revision of specific regulations and standards should achieve cost-effective levels of performance, as well as feasibility of enforcement.

V. ENFORCEMENT

A. CURRENT ENFORCEMENT PROCESSES FOR NEW CONSTRUCTION IN KAZAKHSTAN

As stated above, building regulations and standards in the former Soviet Union were not laws, but rather were documents used to control construction transactions between large governmental entities. In that system, enforcement was ultimately accomplished through the budget and political processes. The purpose of the building regulatory system was defined by the Chief Architect of Karaganda as insuring two categories of quality:

- Quality required by the government in the public interest (e.g., neighbors' rights, garage safety, etc.)
- Quality required by the client

1. Plan Review

Plan review can occur at both the Republic and city levels of government. It begins at the city level, in the department of the Chief Architect, with an activity described as "preparation of legal documents related to land". This activity may be somewhat analogous to a zoning review in the US. In Karaganda, for a state enterprise wishing to build, this phase consists of five steps:

1. Submit application to the Deputy Mayor for Construction, requesting a site, water supply, heating, etc.
2. Mayor's office review of financial status and other administrative issues.

3. Applicant works with Chief Architect's department to allocate land for the project. This work takes place in coordination with departments of Ecology, Sanitation, Fire, and other relevant departments or research institutes.
4. Chief Architect issues a letter over the Mayor's signature authorizing use of site. He also issues "project documentation" consisting of height limitations, site constraints, setbacks, context, colors, etc.
5. Applicant selects architect/engineer and starts project design.

Alma Ata employs a similar process.

Following this municipal process, projects are submitted for review to the Republic or the city, based on cost criteria. Under the former Soviet Union, residential projects (or all projects; this is unclear) over 3 million rubles were reviewed by the Republic. Two years ago this criterion was revised to 12 million rubles. It is reportedly being further revised.

Plan review at the Republic level is carried out by the Department of "Expertise of the Project" in the Ministry of Construction. The function of this department is to control the application of norms in design of all buildings and civil works. The department has a staff of 50 in Alma Ata and 100 in the 19 regions (Oblats). They have experts in many fields, such as architecture, structural engineering, fire protection, electrical engineering, insulation, quantity surveying, etc. If needed, they add specialists from other organizations.

Five-six people review a typical housing project. A recent large industrial oil pipeline project required a review staff of 23. The review process was described as follows:

1. Applicant submits two sets of drawings, costs, and municipal site allocation documents.
2. Reviewers check for compliance. In the case of State projects, they check for compliance with standards and regulations, as well as "project improvements" (decreased cost, improved technology). For other projects they check for compliance with six categories of requirements, also included in the standards and regulations: explosion and fire safety, protection from earthquake, ecological impact, sanitation and hygiene, safety during construction and maintenance, and architectural context.

3. One person combines the various reviewers' comments into a single summary.
4. The Department convenes a project conference to eliminate conflicts. The conference is attended by the client, the designer and the reviewers. If necessary, the project is returned for revisions.
5. A permit is issued by the Department of Control (inspections).

This process reportedly takes one month for average projects, and 1-1/2 months for large projects. The issuance of the permit requires an additional two weeks. Each expert in the Department reviews about eight projects per year.

A similar process was described by the Karaganda Chief Architect for projects reviewed by his office, which has a total staff of 21 (including secretaries and receptionist):

1. Applicant submits project to the Documentation Department (two employees) which assembles a team of experts to review the project. There is a permanent team of experts which serves as the core group for this activity.
2. The team reviews the project----a process which usually takes two weeks. It is returned to the applicant with remarks, if necessary.
3. Negotiations take place with the applicant on adjacent public improvements which he will have to provide. (This specific step was not mentioned for Republic level reviews.)
4. Applicant receives notice of land allocation, as well as the State Act on Land Use(?).
5. Applicant applies to Chief Architect requesting to start construction.
6. The Architectural Inspection Department (four employees) reviews all the legal documents and checks the site for existing constraints.
7. The Architectural Inspection Department issues a permit to construct the building.

The process in Alma Ata is almost identical. They have an "Expertise Department" in the Chief Architect's office, consisting of about five employees (architects, structural and construction engineers, and seismic specialists). Other

Departments involved in the review are Fire, Sanitation, Electrical and Telephone. Each prepares a "report" on the project. The Department of Expertise does not coordinate these reviews, but tries to help resolve conflicts and to arbitrate.

The review process for single family construction is an abbreviated version of the process just described, in which identification of land is the first step and focus of the process. In Karaganda it was described as follows:

1. Applicant submits request to Department of Individual Housing, which was formerly in the Chief Architect's office, but has been spun off and is now self-supporting.
2. Applicant receives site lines and other limitations from Department of Individual Housing.
3. Applicant develops project and submits to District Architect for review. In Karaganda there are four District Architects in the Chief Architect's office, who are responsible for five districts.
4. District Architect reviews the project.
5. Applicant receives "passport" from the city which shows site conditions, building schematic plan, and several legal requirements pertaining to the property. This document is approximately four-six pages. The fee for the "passport" is 1,000 rubles for a 2 million ruble house. Other fees paid by the applicant during the process may reach 5,000 rubles. In the case of large multiple building projects, the "passport" is issued for a prototype building.
6. The owner and his contractor enter into a contractual agreement with the city on a form issued by the Ministry of Construction, but soon to be abolished.
7. Owner obtains loan from bank and starts construction.

The process from start through step 6. (contractual agreement) takes one month, as reportedly required by law. A similar process is followed in Alma Ata.

## 2. Inspections

Inspections of construction for the purpose of controlling quality and enforcing agreements previously were carried out in a collegial system by five state entities:

- The construction enterprise (the contractor)
- The customer (the client, or user)
- The central design organization (the architect/engineer)
- The city government
- The Republic's Ministry of Construction

The first three were reportedly the most continuous inspections. The inspections by the design organization were reportedly the most thorough and comprehensive.

The Department of Control at the Ministry of Construction operates at two levels. At the republic level they have 14-15 employees, and at the region (Oblat) level there are 4-15 Regional Inspection Department employees who report to each of the regional administrations. (Thus, in Alma Ata for example, one finds city inspectors who report to the City Architect, and a Regional Inspection Department with 7 people who inspect in the rest of the region.) The relation of the Republic level to the regions and cities is advisory and methodological.

At the Republic level the inspection staff are mostly structural engineers, one architect and one materials expert. They are authorized to inspect buildings in any region of Kazakhstan. Previously under the planned economy, with only 5-7 construction organizations and a State Planning Committee, it was possible for the small central staff to plan and target their inspections. Now they simply try to cooperate with the regional inspectors, and to assist them. Furthermore, under the former Soviet Union they had a budget to retain experts from other design institutes such as gas, sewer, and heating, in order to expand the scope of their inspections. Now there is no budget for this.

Under the former Soviet system, the Department of Control issued the permit to start construction. This included a list of all responsible people on the project. A rational schedule of inspections was then developed. If the inspectors found deviation from the norms or poor quality of construction they could require corrections. They had the authority to stop payments for the work, to fine the contractor, to stop work, and to require partial or total demolition. They could even sue the contractor in the courts. Now the enforcement authority is unclear.

The Fire Service of the Ministry of Interior seems to have a process similar to that of the Ministry of Construction. Six inspectors at the Republic level carry out periodic inspections of construction throughout the Republic. These are not coordinated with the Ministry of Construction Department of Control.

After construction is completed, a State Commission is convened by the Ministry of Construction to accept the building. The Commission consists of the owner or client, the general contractor, subcontractors, fire protection specialist, sanitation specialist, and the project designer. In the case of housing and schools, the Commissions are appointed for one year by the municipal administration.

Inspections by the city are under the authority of the Chief Architect. In Alma Ata there are 15 inspectors in the Chief Architect's office who work out of the city districts. In Karaganda there is a four-person Architectural Inspection Department in the Chief Architect's office. These inspectors inspect the construction site as well as the construction materials production plants. They are supplemented on the construction site by inspectors from other departments, such as Sanitation, Fire, Electrical, etc. The city inspectors had the same enforcement authority as the Republic inspectors. Previously, their authority to stop payments was reportedly the most effective enforcement tool. Currently the enforcement authority is not clear.

In the case of single family construction in Karaganda, city inspection reportedly does not take place, with the possible exception of electrical inspections.

#### B. INSPECTIONS OF EXISTING BUILDINGS IN KAZAKHSTAN

The subject of maintenance inspections by the government, analogous to housing inspections in the US, was not investigated. However, two categories of existing building inspections were mentioned in the course of the discussions.

First, the Fire Service in cities and their districts carry out inspections of existing buildings, in addition to their responsibility for inspection of new construction.

Second, Kazakhstan reportedly began to address the issue of seismic safety in existing buildings eight years ago. A decision has reportedly been taken by the Commission on Emergencies to inspect all existing buildings in seismic regions of Kazakhstan.

#### C. LICENSING

The subject of licensing of various building process participants was not investigated. However, two aspects of licensing came up in discussions.

First, it was reported that architects and engineers are licensed for a period of three years, after which they are retested. It is unclear whether this report applies to all of Kazakhstan, to seismic regions, or to the Alma Ata region. It is also unclear whether the subject of this licensing is limited to seismic design or to all aspects of design.

Second, it was reported that there is currently no licensing of contractors in Kazakhstan.

D. PERCEIVED PROBLEMS

As mentioned earlier, there is a general perception that the quality of construction has deteriorated in recent years. This is, at least in part, attributable to problems of enforcement. The collegial system of enforcement practiced in the former Soviet Union may have worked, but today it does not. The government's authority to enforce regulations, both at the Republic and city levels, is not defined in the law, regulations or practice.

Mr. Kokoyev, Chief of the Department of "Expertise" in the Ministry of Construction stated that while the percentage of projects requiring resubmission was somewhat higher than it was five years ago (44% versus 33%), many projects were not submitted in the first place.

Mr. Tusupbekov, Chief Architect of Karaganda, characterized that current absence of enforcement authority as follows: "Previously there was one State Bank, and it was easy for the city to force the stopping of payments on a construction project. Now it is unclear how to stop financing, or what the government's responsibility is." He also spoke of the need to professionalize the entire building process, and to license contractors.

Mr. Aitmuchambetov, Chief Specialist of the Fire Service in the Ministry of Interior, spoke of unauthorized substitution of non-complying materials for approved materials (in terms of flame spread), highlighting an enforcement problem.

E. KAZAKHSTANI PLANNED ACTIVITIES

Current plans in Kazakhstan are not clear at this time.

One official reported that legislation is under consideration which would authorize the Ministry of Construction to review only projects financed by the Republic. Other projects would be reviewed by any entity licensed for that purpose by the Ministry of Construction.

Mr. Dosmagambetov stated that the Ministry wants to stop substandard construction by controlling the contractors, establishing a testing and certification program, and creating the authority to revoke licenses.

F. OVERVIEW OF SYSTEM IN THE US

The framework for enforcing the building code is addressed in each of the three model codes. Attachment D is a copy of Article 1 ADMINISTRATION AND ENFORCEMENT from the BOCA National Building Code/1990. Attachment E is a diagram of that framework, and forms the basis for the following discussion. It should be

noted that the enforcement of related regulations, such as zoning ordinances, is not covered in this discussion.

In states which have adopted a statewide preemptive code, code enforcement may be carried out by the state government, the local government, or some combination of the two. In states where codes are adopted only by the local jurisdictions, enforcement is also their responsibility.

Code enforcement is usually a self-supporting governmental activity. Fees collected from applicants usually cover the government's enforcement costs.

## 1. Plan Review

a. Application for Permit: The permit application by the owner includes the submission of building plans, specifications, computations, test results, and any other data necessary to describe the building. For certain innovative systems or products included in the design, the submission may also include an evaluation report previously produced by a model code group. The permit application also involves the payment of a fee. Some jurisdictions have multiple permits (e.g., building, electrical, mechanical, etc.) while others have a single combined permit.

b. Review for Approval: The review may be done by personnel of the regulatory authority (the building department), by other governmental departments, or by private contractors. Fire related plan reviews are often done by personnel of the Fire Prevention Bureau within the local fire department and/or by personnel of the State Fire Marshal.

c. Redesign and Resubmission: There may be several cycles of redesign, review, and resubmission.

d. Appeal: The Appeals process is established in order to deal with special conditions, hardship etc. Frequently it is a political process.

e. Issuance of Permit(s): The issuance of one or more permits allows the owner to start construction activities on the site. The permit(s) also allow the regulatory authority access to the construction site for purposes of inspection.

## 2. Inspection

f. Construction Inspections: The purpose of construction inspections is to judge compliance of the construction work with the approved plans and specifications. Inspections may be done by personnel of the regulatory authority (the building department), by other governmental departments, or by private contractors (engineers, testing laboratories etc.). Fire related inspections are often done by personnel of the Fire

Prevention Bureau within the local fire department and/or by personnel of the State Fire Marshal. The frequency and nature of the inspections depend on the complexity of the project. Typically, the following inspections are made:

- site and terrain
- foundations
- structural frame
- fire protection system
- mechanical equipment
- plumbing facilities
- electrical equipment and systems
- final

In the case of fabricated products, inspectors will ascertain that required labels are present. These labels are the products of an independent process of inspection and quality control at the fabrication plant.

g. Reconstruction or Correction: The regulatory inspectors may issue correction notices for particular items of work, they may issue stop work orders, and they may take more aggressive actions which could result in fines. They cannot usually revoke a contractor's license without a legal proceeding.

h. Appeal: This is similar to d. above.

i. Issuance of Certificate of Occupancy: A Certificate of Occupancy is issued by the regulatory authority after all the inspections have been performed, all deficiencies have been corrected, and all construction is complete. This allows the building to be occupied and used for a particular purpose, as defined in the building code. Should the nature of the use of the building be changed at some point in time, the owner is required to submit an application for a permit (a. above), and if the building code has established certain requirements applicable to that change of use, the entire process is repeated.

## G. RECOMMENDATIONS

### 1. Governmental Authority to Enforce Building Codes and Standards

Article 1 ADMINISTRATION AND ENFORCEMENT of the BOCA National Building Code/1990 was translated into Russian and handed out to all seminar attendees. There appeared to be great interest in this subject. Article 1 of the BOCA Code, and the respective sections of the other two US model codes, are frequently amended or substituted completely by adopting authorities (states or local governments) in the US in order to be consistent with their respective constitutions, legal frameworks and administrative structures. These changes or

substitutions usually deal with such issues as regulatory authority, relationship to other regulations, and the administrative responsibilities of various levels of government.

The Ministry of Construction may find that Article 1 of the BOCA Code provides a useful outline or framework for the establishment of governmental authority to enforce codes and standards, and may wish to use it in developing its own administrative and enforcement provisions, which will incorporate actions taken in accordance with the following Recommendations 2 and 3.

2. Division of Authority Between the Republic and Local Governments

Building code enforcement in the US varies from state to state. In some cases it is a state function, in others it is shared between state and local governments, and in yet others it is entirely local. There are constitutional, historic and technical reasons for these variations.

In order to arrive at a definition of the division of authority between the Republic and local governments, the Ministry of Construction should observe the general rule that it is advisable to place enforcement activities at the local level where they are readily accessible to the users (owners, developers, designers and builders). At the same time, the enforcement entity should have the complete range of necessary expertise. These two factors should determine the divisions of governmental enforcement. For example, in rural areas enforcement may be better served at the Oblast rather than the municipal level.

3. Improvement of Enforcement Procedures

Building code enforcement inspection activities in the US are scheduled to occur at specific, critical phases of the construction process. While similar schedules are recognized in Kazakhstan, interviews in Karaganda suggested that enforcement inspections are not being carried out, especially in the case of individual house developments. This may be due to inadequate staffing and to the undefined enforcement authority in private construction.

The Ministry of Construction and/or other appropriate levels of government should establish well defined code enforcement inspection procedures. These should include site visits related to specific phases of construction as well as a final inspection upon completion of the project. The procedures should be based on a clear understanding of the applicable regulatory authority, the legal remedies available to the enforcement agency, and a commitment to the protection of the public health and safety.

Initially, the procedures should focus on specific problem areas currently identified as contributing to defective construction.

#### VI. MISCELLANEOUS OBSERVATIONS ON BUILDING TECHNOLOGY

1. Construction sites visited in Alma Ata and Karaganda looked clean and well organized. However, based on a limited number of site visits, it appears that the sequencing of construction trades on the job is not particularly sophisticated. The common practice in both multi-family and single family projects appears to be that the structure and shell of the building are completed entirely before the mechanical, electrical and finish trades come on the job. By contrast, most of the construction trades in the US work on the project at the same time. This calls for tight coordination and careful management. The reason for this practice is to meet the goal of early completion, since most of the project participants work with borrowed funds and early completion translates into reduced interest costs.

2. Cast in place concrete technology is limited to steel wall forms. In combination with precast concrete floor panels, they are progressing at the rate of three floors per month on a 840-unit project of 9-10 story building in Alma Ata. This is well below rates which are achieved in the west with the use of table forms and/or tunnel forms, to cast in place the entire building.

3. Stair uniformity appears to be pervasive problem in Kazakhstan. Concrete stairs are precast and uniform, but get into trouble at the top and bottom of the runs. Very high or very low steps are typical. In the US this would be a code violation and considered hazardous.

4. Construction on a project of 1,000 single family houses in Karaganda was reportedly halted because it was impossible to bring district steam to each house, and alternative heating systems were not initially considered.

**APPENDIX A**

**FIGURES**

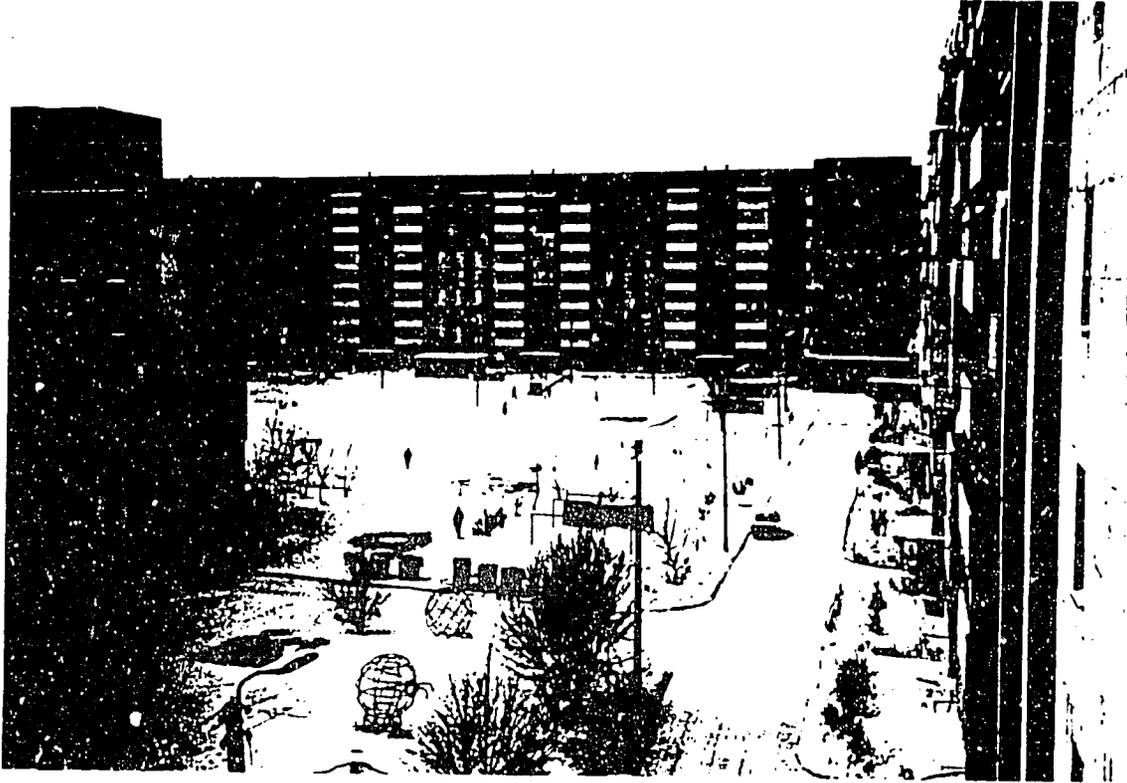


Figure 1. Multi-Family Housing in Karaganda



Figure 2. Alma Ata Neighborhood Reportedly Scheduled for Demolition



Figure 3. Duplex Housing in Alma Ata



Figure 4. Single Family Housing in Karaganda

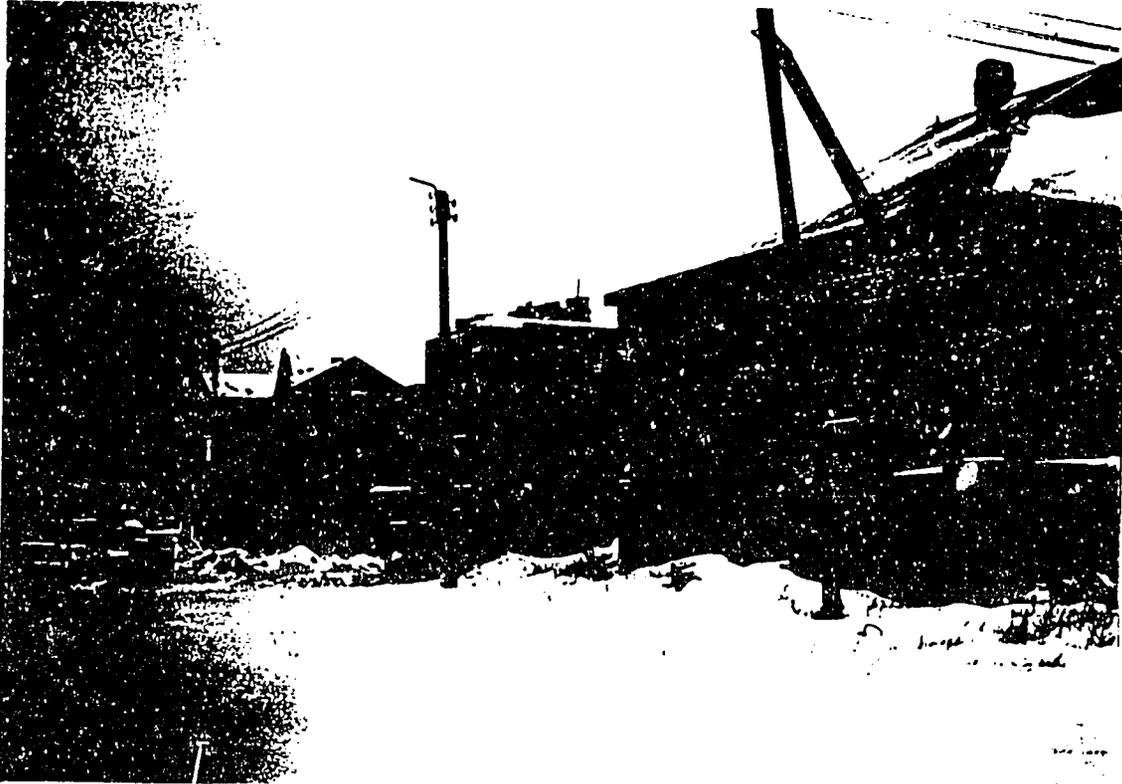


Figure 5. Single Family Housing in Karaganda



Figure 6. Single Family House in Karaganda



Figure 7. "Monolithic" Housing Construction in Alma Ata

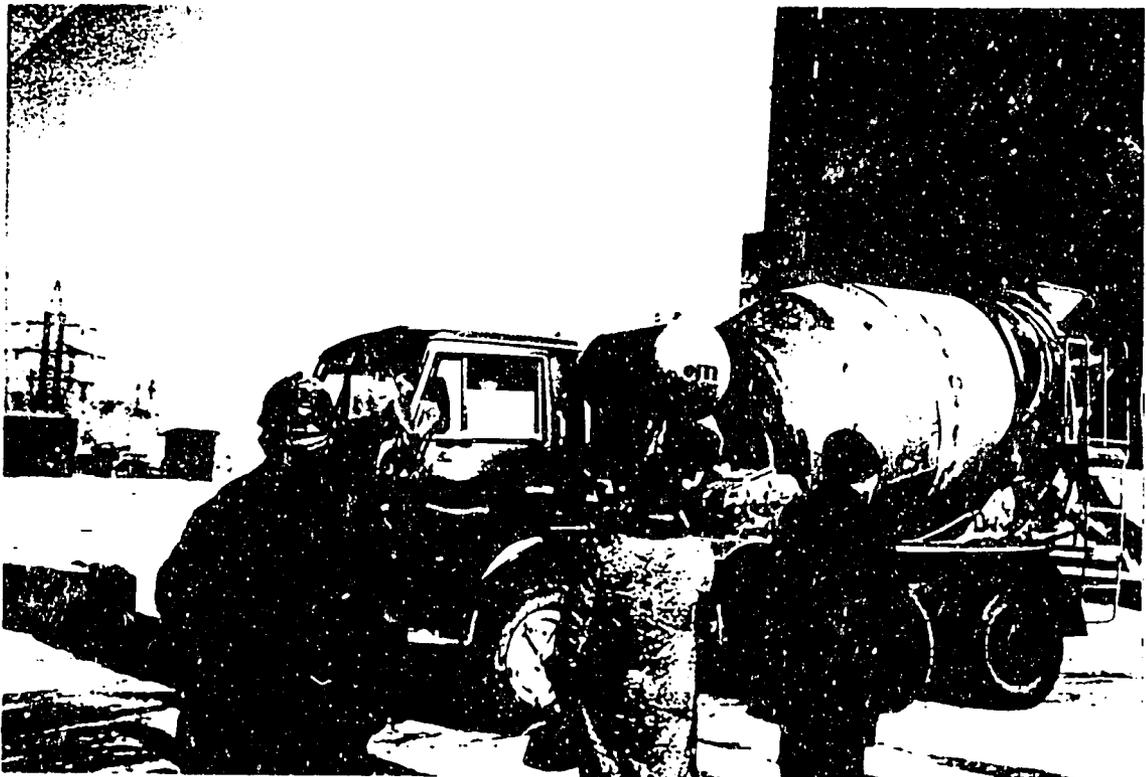


Figure 8. Concrete Truck at Alma Ata Construction Site

31

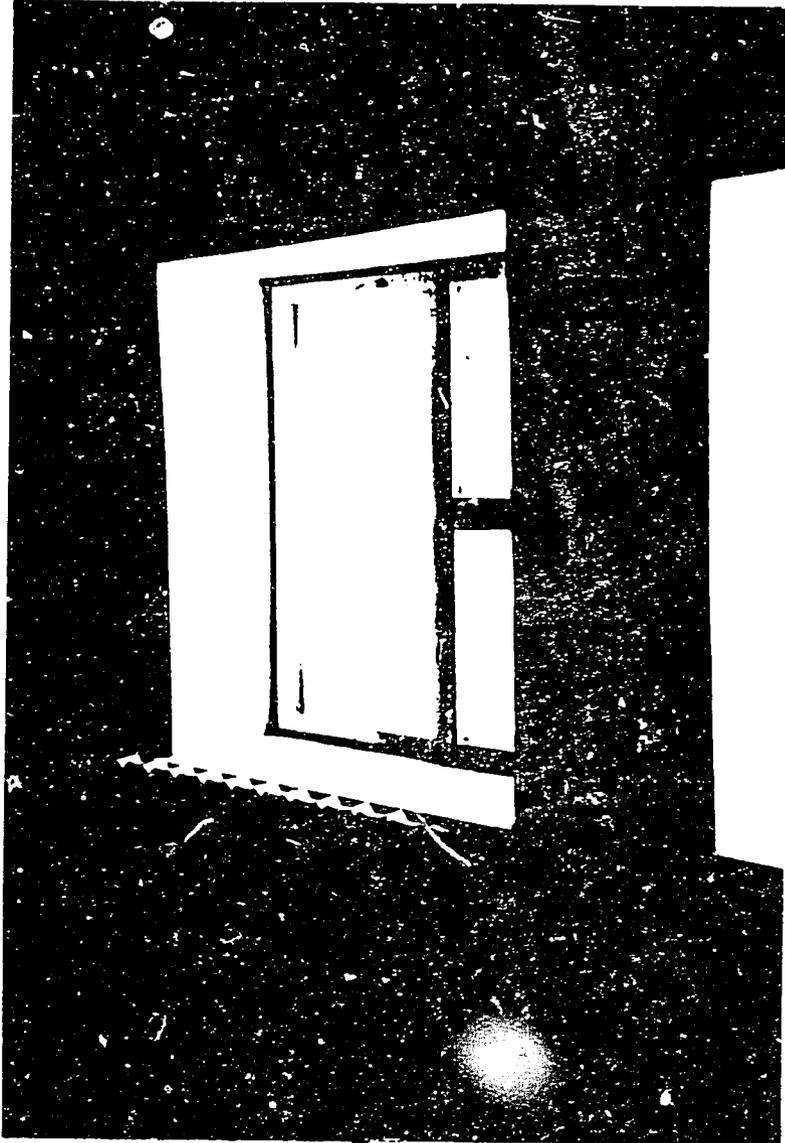


Figure 9. Thick Masonry Walls in Karaganda High Rise



Figure 10. Thick Masonry Walls in Karaganda Single Family House

22



69  
Figure 11. Wall Paper and Linoleum Flooring  
in Karaganda Interior

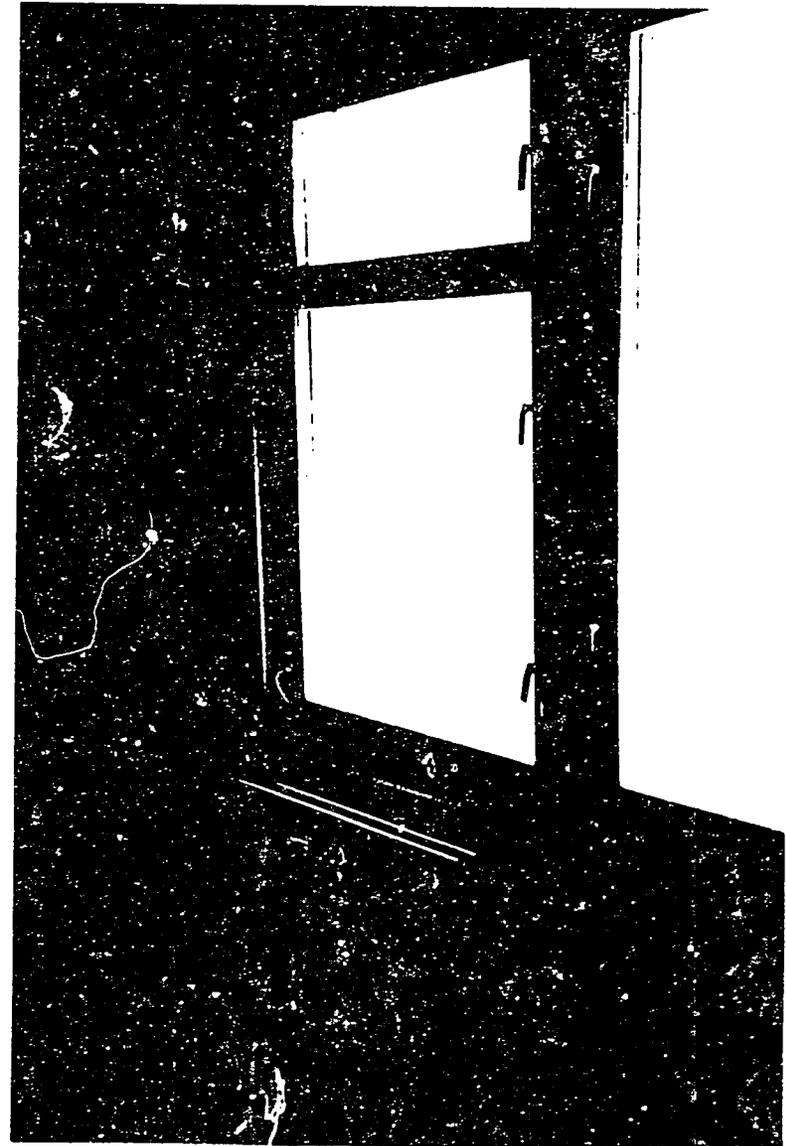


Figure 12. Wood Door and Window in Alma Ata  
Interior

**APPENDIX B**  
**LIST OF PERSONS INTERVIEWED**

**APPENDIX B**  
**LIST OF PERSONS INTERVIEWED**

- Mr. Bair Dosmagambetov, Deputy Chairman, State Architecture and Building Committee, and Deputy Minister, Ministry of Construction.
- Mr. Eric Ozoling, Deputy Chairman, State Architecture and Building Committee.
- Mr. Muchambetov, Director, Department of Housing and Public Buildings, Ministry of Construction.
- Mr. Kokoyev, Director, Department of "Expertise of the Project" Ministry of Construction.
- Mr. Jumashev, Director, Department of Control, Ministry of Construction.
- Mr. Amanjal Aitmuchambetov, Chief Specialist of the Fire Service, Ministry of Interior.
- Mr. Vladimir Markus, Engineer, and Mr. Sysymgali Erzhanov, Research Director, Kazakh Research and Experimental Design Institute on Earthquake Engineering and Architecture.
- Mr. Omarov, Deputy Director, Department of Standards, Ministry of Construction.
- Mr. Bulachenko, Deputy Mayor for Construction, Karaganda.
- Mr. Karim Tusupbekov, Chief Architect, City of Karaganda.
- Ms. Ludmilla Gradskaya, Chief, Department of Documentation, Office of the Chief Architect, City of Karaganda.
- Mr. Mazan Sergazin, Chief, Building, Improvement and Extraordinary Situations Department, City of Alma Ata.

**ATTACHMENT A**  
**TABLE OF CONTENTS**  
**OF**  
**THE BOCA NATIONAL BUILDING CODE/1990**

# THE BOCA NATIONAL BUILDING CODE/1990

## Table of Contents

Article 1	ADMINISTRATION AND ENFORCEMENT
Article 2	DEFINITIONS
Article 3	USE GROUP CLASSIFICATION
Article 4	TYPES OF CONSTRUCTION CLASSIFICATION
Article 5	GENERAL BUILDING LIMITATIONS
Article 6	SPECIAL USE AND OCCUPANCY REQUIREMENTS
Article 7	INTERIOR ENVIRONMENTAL REQUIREMENTS
Article 8	MEANS OF EGRESS
Article 9	FIRERESISTIVE CONSTRUCTION
Article 10	FIRE PROTECTION SYSTEMS
Article 11	STRUCTURAL LOADS
Article 12	FOUNDATION SYSTEMS AND RETAINING WALLS
Article 13	MATERIALS AND TESTS
Article 14	MASONRY
Article 15	CONCRETE
Article 16	GYP SUM AND PLASTER
Article 17	WOOD
Article 18	STEEL
Article 19	LIGHTWEIGHT METAL ALLOYS
Article 20	PLASTIC
Article 21	EXTERIOR WALLS
Article 22	VERTICAL AND SLOPED GLASS AND GLAZING
Article 23	ROOFS AND ROOF COVERINGS
Article 24	MASONRY EQUIPMENT AND SYSTEMS
Article 25	MECHANICAL EQUIPMENT AND SYSTEMS
Article 26	ELEVATOR, DUMBWAITER AND CONVEYOR EQUIPMENT, INSTALLATION AND MAINTENANCE
Article 27	ELECTRIC WIRING, EQUIPMENT AND SYSTEMS
Article 28	PLUMBING SYSTEMS
Article 29	SIGNS
Article 30	PRECAUTIONS DURING BUILDING OPERATIONS
Article 31	ENERGY CONSERVATION
Article 32	REPAIR, ALTERATION, ADDITION TO AND CHANGE OF USE OF EXISTING BUILDINGS

## APPENDICES

Appendix A	REFERENCED STANDARDS
Appendix B	UNIT DEAD LOADS FOR DESIGN PURPOSES
Appendix C	RECOMMENDED FASTENING SCHEDULE
Appendix D	METRIC EQUIVALENTS

**ATTACHMENT B**

**THE STANDARDS NETWORK FOR REINFORCED CONCRETE**

**THE STANDARDS NETWORK FOR  
REINFORCED CONCRETE**

ORDER OF HIERARCHY	DOCUMENT TITLE	STANDARDS REFERENCED
Primary document	Building Code	References 285 standards including ACI 318
First order standards	ACI 318	References 42 standards including ASTM C150
Second order standards	ASTM C150	References 18 standards including ASTM C33
Third order standards	ASTM C33	References 21 standards including ASTM C29
Fourth order standards	ASTM C29	References 7 standards

**ATTACHMENT C**

**SAMPLE ORDINANCE FOR ADOPTION OF THE  
1990 BOCA NATIONAL BUILDING CODE**

## ADOPTION INFORMATION

The *BOCA National Codes* are designed and promulgated to be adopted by reference by ordinance. Jurisdictions wishing to adopt the *BOCA National Building Code/1990* as enforceable minimum construction safety requirements should insure that certain factual information is included in the adopting ordinance at the time adoption is being considered by the appropriate governmental body. The following sample adoption ordinance addresses several key elements of a code adoption ordinance, including the information required for insertion into the code text.

### SAMPLE ORDINANCE FOR ADOPTION OF THE 1990 BOCA NATIONAL BUILDING CODE

Bill Number \_\_\_\_\_ Ordinance Number \_\_\_\_\_

AN ORDINANCE ESTABLISHING MINIMUM REGULATIONS GOVERNING THE DESIGN, CONSTRUCTION, ALTERATION, ENLARGEMENT, REPAIR, DEMOLITION, REMOVAL, MAINTENANCE AND USE OF ALL BUILDINGS AND STRUCTURES; PROVIDING FOR THE ISSUANCE OF PERMITS, COLLECTION OF FEES, MAKING OF INSPECTIONS; PROVIDING PENALTIES FOR THE VIOLATION THEREOF; KNOWN AS THE BUILDING CODE; AND REPEALING EXISTING ORDINANCE NUMBER (*Present Ordinance, If Any*) OF THE (*Type of Jurisdiction*) OF (*Name of Jurisdiction*), STATE OF (*State Name*).

Be it ordained by the (*Governing Body*) of the (*Name Of Jurisdiction*) as follows:

#### SECTION 1. ADOPTION OF BUILDING CODE.

That a certain document, three (3) copies of which are on file in the office of the (*Jurisdiction's Keeper of Records*) of the (*Type of Jurisdiction*) of (*Name of Jurisdiction*) being marked and designated as "The BOCA National Building Code, Eleventh Edition, 1990" as published by The Building Officials and Code Administrators International, Inc. be and is hereby adopted as the Building Code of the (*Type of Jurisdiction*) of (*Name of Jurisdiction*) in the State of (*State Name*); for the control of buildings and structures as herein provided; and each and all of the regulations, provisions, penalties, conditions and terms of said BOCA National Building Code, are hereby referred to, adopted and made a part hereof as if fully set out in this Ordinance, with the additions, insertions, deletions and changes, if any, prescribed in Section 3 of this Ordinance.

#### SECTION 2. INCONSISTENT ORDINANCES REPEALED.

That Ordinance Number (*Present Ordinance Number*) of the (*Type of Jurisdiction*) of (*Name of Jurisdiction*) entitled (*Full Title of Present Ordinance*) and all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

**ATTACHMENT D**

**ARTICLE 1 - ADMINISTRATION AND ENFORCEMENT  
BOCA NATIONAL BUILDING CODE**

# ARTICLE 1

## ADMINISTRATION AND ENFORCEMENT

### SECTION 100.0 SCOPE

**100.1 Title:** These regulations shall be known as the Building Code of [NAME OF JURISDICTION] hereinafter referred to as "this code."

**100.2 Scope:** These regulations shall control all matters concerning the construction, *alteration*, *addition*, repair, removal, demolition, use, location, occupancy and maintenance of all buildings and structures, and shall apply to existing or proposed buildings and structures; except as such matters are otherwise provided for in other ordinances or statutes, or in the rules and regulations authorized for promulgation under the provisions of this code.

**100.3 Application of references:** Unless otherwise specifically provided for in this code, all references to article or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such article, section or provision of this code.

**100.4 Code remedial:** This code shall be construed to secure its expressed intent, which is to insure public safety, health and welfare insofar as they are affected by building construction, through structural strength, adequate *means of egress* facilities, sanitary equipment, light and *ventilation*, and fire safety; and, in general, to secure safety to life and property from all hazards incident to the design, erection, repair, removal, demolition or use and occupancy of buildings, structures or premises.

### SECTION 101.0 APPLICABILITY

**101.1 General:** The provisions of this code shall apply to all matters affecting or relating to buildings and structures, as set forth in Section 100.0.

**101.2 Exemptions:** A building or structure shall not be constructed, extended, repaired, removed or altered in violation of these provisions, except for repairs as defined in Section 104.0, and except that the raising, lowering or moving of a building or structure as a unit necessitated by a change in legal grade or widening of a street shall be permitted, provided that the building or structure is not otherwise altered or its use or occupancy changed.

**101.3 Matters not provided for:** Any requirements that are essential for the structural, fire or sanitary safety of an existing or proposed building or structure, or for the safety of the occupants thereof, which are not specifically provided for by this code, shall be determined by the code official.

**101.4 Continuation of unlawful use:** The continuation of occupancy or use of a building or structure, or part thereof, contrary to the provisions of this code, shall be deemed a violation and be subject to the penalties prescribed in Section 117.0.

**101.5 Other regulations:** When the provisions herein specified for health, safety and welfare are more restrictive than other regulations, this code shall control; but in any case, the most rigid requirements of either the building code or other regulations shall apply whenever a conflict exists.

**101.6 Referenced standards:** The standards referenced in this code and listed in Appendix A shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and referenced standards, the provisions of this code shall apply.

#### SECTION 102.0 VALIDITY

**102.1 Partial invalidity:** In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making void or illegal any of the other parts or provisions thereof, which are determined to be legal; and it shall be presumed that this code would have been passed without such illegal or invalid parts or provisions.

**102.2 Segregation of invalid provisions:** Any invalid part of this code shall be segregated from the remainder of the code by the court holding such part invalid, and the remainder shall remain effective.

**102.3 Decisions involving existing structures:** The invalidity of any provision in any section of this code as applied to existing buildings and structures shall not be held to affect the validity of such section in its application to buildings and structures hereafter erected.

#### SECTION 103.0 EXISTING STRUCTURES

**103.1 Continuation of existing use:** The legal use and occupancy of any structure existing on the date of adoption of this code, or for which it has been heretofore approved, shall be permitted to continue without change, except as is specifically covered in this code, the property maintenance or fire prevention codes listed in Appendix A, or as is deemed necessary by the code official for the general safety and welfare of the occupants and the public.

**103.2 Change in use:** It shall be unlawful to make any change in the use or occupancy of any structure or portion thereof which would subject it to any special provisions of this code without approval of the code official, and the code official's certification that such structure meets the intent of the provisions of law governing

building construction for the proposed new use and occupancy, and that such *change of use* does not result in any greater hazard to the public safety or welfare.

**103.3 Additions, alterations or repairs:** *Additions, alterations* or repairs to any structure shall conform to that required of a new structure without requiring the existing structure to comply with all of the requirements of this code. *Additions, alterations* or repairs shall not cause an existing structure to become unsafe or adversely affect the performance of the building. Any building plus new *additions* shall not exceed the *height*, number of stories and *area* specified for new buildings.

*Alterations* or repairs to an existing structure which are structural or adversely affect any structural member or any part of the structure having a required fire-resistance rating shall be made with materials required for a new structure.

**103.4 Rehabilitation:** Buildings existing prior to [DATE TO BE INSERTED BY THE JURISDICTION. NOTE: IT IS RECOMMENDED THAT THIS DATE COINCIDE WITH THE EFFECTIVE DATE OF BUILDING CODES WITHIN THE JURISDICTION], in which there is work involving repairs, *alterations, additions* or *changes of use*, shall be made to conform to the code by applying the requirements of Article 32 or the provisions of Articles 2 through 31.

#### SECTION 104.0 REPAIRS AND MAINTENANCE

**104.1 Repairs:** Application or notice to the code official is not required for ordinary repairs to structures, but such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the *exit* requirements; nor shall ordinary repairs include addition to, alteration of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

**104.2 Maintenance:** All buildings and structures and all parts thereof, both existing and new, shall be maintained in a safe and sanitary condition. All service equipment, *means of egress*, devices and safeguards which are required by this code in a building or structure, or which were required by a previous statute in a building or structure, when erected, altered or repaired, shall be maintained in good working order.

**104.3 Owner responsibility:** The owner or the owner's designated agent shall be responsible for the safe and sanitary maintenance of the building or structure and its *means of egress* facilities at all times.

#### SECTION 105.0 DEMOLITION OF STRUCTURES

**105.1 Service connections:** Before a structure can be demolished or removed, the owner or agent shall notify all utilities having service connections within the structure such as water, electric, gas, sewer and other connections. A permit to demolish or remove a structure shall not be issued until a release is obtained from the utilities, stating that their respective service connections and appurtenant equipment, such

as meters and regulators, have been removed or sealed and plugged in a safe manner.

**105.2 Notice to adjoining owners:** Only when *written notice* has been given by the applicant to the owners of adjoining *lots* and to the owners of wired or other facilities, of which the temporary removal is necessitated by the proposed work, shall a permit be granted for the removal of a building or structure.

**105.3 Lot regulation:** Whenever a structure is demolished or removed, the premises shall be maintained free from all unsafe or hazardous conditions by the proper regulation of the *lot*, restoration of established grades and the erection of the necessary retaining *walls* and fences in accordance with the provisions of Article 30.

#### SECTION 106.0 MOVED STRUCTURES

**106.1 Compliance:** Buildings and structures moved into or within the jurisdiction shall comply with the provisions of this code for new buildings and structures and shall not be used or occupied in whole or in part until the *certificate of use and occupancy* has been issued by the code official.

#### SECTION 107.0 APPROVAL

**107.1 Approved materials and equipment:** All materials, equipment and devices approved for use by the code official shall be constructed and installed in accordance with such approval.

**107.2 Modifications:** When there are practical difficulties involved in carrying out structural or mechanical provisions of this code, the code official shall have the right to vary or modify such provisions upon application of the owner or the owner's representative, provided that the spirit and intent of the law is observed and that the public health, safety and welfare is assured.

**107.2.1 Records:** The application for modification and the final decision of the code official shall be in *writing* and shall be officially recorded with the application for the permit in the permanent records of the department of building inspection.

**107.3 Used materials and equipment:** Used materials, equipment and devices shall not be reused unless they have been reconditioned, tested and placed in good and proper working condition and approved for use by the code official.

**107.4 Alternative materials and equipment:** The provisions of this code are not intended to prevent the use of any material or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material or method of construction shall be approved when the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

#### SECTION 108.0 PROFESSIONAL ARCHITECTURAL AND ENGINEERING SERVICES

**108.1 General:** All design for new construction work, *alteration*, repair, expansion, *addition* or modification work involving the practice of professional architecture or engineering, as defined by the statutory requirements of the professional registration laws of the state in which the construction is to be undertaken, shall be prepared by registered professional architects or engineers as certified by such state. All plans, computations and specifications required for a building permit application for such work shall be prepared by or under the direct supervision of a registered architect or engineer and bear that architect's or engineer's signature and seal in accordance with the state's statutes and regulations governing the professional registration and certification of architects or engineers.

**108.2 Special inspections:** *Special inspections* shall be made in accordance with Section 1308.0.

**108.2.1 Building permit requirement:** This *special inspection* requirement shall be determined prior to the issuance of the building permit and shall be a requisite for the permit issuance as described in Section 1308.0.

**108.2.2 Fees and costs:** All fees and costs related to the performance of special professional services shall be borne by the owner.

#### SECTION 109.0 DEPARTMENT OF BUILDING INSPECTION

**109.1 Code official:** The department of building inspection is hereby created and the executive official in charge thereof shall be known as the code official.

**109.2 Appointment:** The code official shall be appointed by the chief appointing authority of the jurisdiction; and the code official shall not be removed from office except for cause and after full opportunity to be heard on specific and relevant charges by and before the appointing authority.

**109.3 Organization:** The code official shall appoint such number of officers, technical assistants, inspectors and other employees as shall be necessary for the administration of this code and as authorized by the appointing authority.

**109.4 Deputy:** The code official is authorized to designate an employee as deputy who shall exercise all the powers of the code official during the temporary absence or disability of the code official.

**109.5 Restriction of employees:** An official or employee connected with the department of building inspection, except one whose only connection is that of a member of the board of survey or of the board of appeals established under the provisions of Sections 123.0 and 124.0, shall not be engaged in or directly or indirectly connected with the furnishing of labor, materials or appliances for the construction, *alteration* or maintenance of a building, or the preparation of plans or of specifications thereof, unless that person is the owner of the building; nor shall such officer or employee engage in any work which conflicts with official duties or with the interests of the department.

**109.6 Relief from personal responsibility:** The code official, officer or employee charged with the enforcement of this code, while acting for the jurisdiction, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of any act required or permitted in the discharge of official duties. Any suit instituted against an officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code; and any officer of the department of building inspection, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

**109.7 Official records:** An official record shall be kept of all business and activities of the department specified in the provisions of this code, and all such records shall be open to public inspection at all appropriate times.

#### SECTION 110.0 DUTIES AND POWERS OF THE CODE OFFICIAL

**110.1 General:** The code official shall enforce all of the provisions of this code and shall act on any question relative to the mode or manner of construction and the materials to be used in the erection, *addition* to, *alteration*, repair, removal, demolition, installation of service equipment and the location, use, occupancy and maintenance of all buildings and structures, except as otherwise specifically provided for by statutory requirements or as provided for in Sections 110.2 through 110.8.

**110.2 Applications and permits:** The code official shall receive applications and issue permits for the erection and *alteration* of buildings and structures, inspect the premises for which such permits have been issued and enforce compliance with the provisions of this code.

**110.3 Building notices and orders:** The code official shall issue all necessary notices or orders to remove illegal or unsafe conditions, to require the necessary safeguards during construction, to require adequate *means of egress* facilities in existing buildings and structures, and to insure compliance with all the code requirements for the health, safety and general welfare of the public.

**110.4 Inspections:** The code official shall make all of the required inspections, or the code official shall accept reports of inspection by *approved agencies* or individuals. All reports of such inspections shall be in *writing* and certified by a responsible officer of such *approved agency* or by the responsible individual. The code official is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

**110.5 Credentials:** The code official and authorized representatives shall carry proper credentials of their respective office for the purpose of inspecting any and all buildings and premises in the performance of duties under this code.

**110.6 Rule-making authority:** The code official shall have power as necessary in the interest of public health, safety and general welfare, to adopt and promulgate rules and regulations to interpret and implement the provisions of this code to secure the intent thereof and to designate requirements applicable because of local climatic or other conditions. Such rules shall not have the effect of waiving structural or fire performance requirements specifically provided for in this code or of violating accepted engineering practice involving public safety.

**110.7 Department records:** The code official shall keep official records of applications received, permits and *certificates* issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records so long as the building or structure to which they relate remains in existence unless otherwise provided for by other regulations.

**110.8 Annual report:** At least annually, the code official shall submit to the chief authority of the jurisdiction a written statement of operations in the form and content as shall be prescribed by such authority.

#### SECTION 111.0 APPLICATION FOR PERMIT

**111.1 When permit is required:** It shall be unlawful to construct, enlarge, alter or demolish a structure; or change the occupancy of a building or structure requiring greater strength, *exit* or sanitary provisions; or to change to another use; or to install or alter any equipment for which provision is made or the installation of which is regulated by this code, without first filing an application with the code official *in writing* and obtaining the required permit therefor; except that repairs, as defined in Section 104.0 and which do not involve any violation of this code, shall be exempted from this provision.

**111.2 Form of application:** The application for a permit shall be submitted in such form as the code official prescribes and shall be accompanied by the required fee as prescribed in Section 114.0.

**111.3 By whom application is made:** Application for a permit shall be made by the owner or lessee of the building or structure, or agent of either, or by the licensed engineer or architect employed in connection with the proposed work. If the application is made by a person other than the owner in fee, it shall be accompanied by an affidavit of the owner or the qualified applicant or a signed statement of the qualified applicant witnessed by the code official or his designee to the effect that the proposed work is authorized by the owner in fee and that the applicant is authorized to make such application. The full names and addresses of the owner, lessee, applicant, and of the responsible officers, if the owner or lessee is a corporate body, shall be stated in the application.

**111.4 Description of work:** The application shall contain a general description of the proposed work, the location of the proposed work, the use and occupancy of all parts of the building or structure and of all portions of the site or *lot* not covered

by the building or structure, provisions for special inspections required by Section 108.0, and such additional information as required by the code official.

**111.5 Plans and specifications:** The application for the permit shall be accompanied by not less than two copies of specifications and of plans drawn to scale, with sufficient clarity and detail dimensions to show the nature and character of the work to be performed. When quality of materials is essential for conformity to this code, specific information shall be given to establish such quality; and this code shall not be cited, or the term "legal" or its equivalent be used, as a substitute for specific information. The code official is permitted to waive the requirement for filing plans when the work involved is of a minor nature.

**111.6 Site plan:** There shall also be a site plan showing to scale the size and location of all new construction and all existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the plot plan shall show all construction to be demolished and the location and size of all existing structures and construction that are to remain on the site or plot.

**111.6.1 Private sewage disposal system:** The site plan shall indicate the location of a private sewage disposal system when a public sewer is not available. All technical data and soil data required by the private sewage disposal code listed in Appendix A shall be submitted with the site plan.

**111.7 Engineering details:** The code official shall require to be filed adequate details of structural, mechanical and electrical work, including computations, stress diagrams and other essential technical data. All engineering plans and computations shall bear the signature and seal of the engineer or architect responsible for the design as required by Section 108.1.

**111.8 Amendments to application:** Subject to the limitations of Section 111.9, amendments to a plan, application or other records accompanying the same shall be filed at any time before completion of the work for which the permit is sought or issued. Such amendments shall be deemed part of the original application and shall be filed therewith.

**111.9 Time limitation of application:** An application for a permit for any proposed work shall be deemed to have been abandoned six months after the date of filing, unless such application has been diligently prosecuted or a permit shall have been issued; except that the code official shall grant one or more extensions of time for additional periods not exceeding 90 days each if there is reasonable cause.

## SECTION 112.0 PERMITS

**112.1 Action on application:** The code official shall examine or cause to be examined all applications for permits and amendments thereto within a reasonable time after filing. If the application or the plans do not conform to the requirements of all pertinent laws, the code official shall reject such application in *writing*, stating the reasons therefor. If the code official is satisfied that the proposed work con-

forms to the requirements of this code and all laws and ordinances applicable thereto, the code official shall issue a permit therefor as soon as practicable.

**112.2 Suspension of permit:** Any permit issued shall become invalid if the authorized work is not commenced within six months after issuance of the permit, or if the authorized work is suspended or abandoned for a period of six months after the time of commencing the work.

**112.3 Previous approvals:** This code shall not require changes in the plans, construction or designated use of a building for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been actively prosecuted within 90 days after the effective date of this ordinance and is completed with dispatch.

**112.4 Signature to permit:** The code official's signature shall be attached to every permit; or the code official shall authorize a subordinate to affix such signature thereto.

**112.5 Approved plans:** The code official shall stamp or endorse in *writing* both sets of corrected plans "Approved," and one set of such approved plans shall be retained by the code official and the other set shall be kept at the building site, open to inspection of the code official or an authorized representative at all reasonable times.

**112.6 Revocation of permits:** The code official shall revoke a permit or approval issued under the provisions of this code in case of any false statement or misrepresentation of fact in the application or on the plans on which the permit or approval was based.

**112.7 Approval of part:** The code official is authorized to issue a permit for the construction of foundations or any other part of a building or structure before the entire plans and specifications for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with all of the pertinent requirements of this code. The holder of such permit for the foundation or other parts of a building or structure shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire structure will be granted.

**112.8 Posting of permit:** A true copy of the building permit shall be kept on the site of operations, open to public inspection during the entire time of prosecution of the work and until the completion of the same.

**112.9 Notice of start:** At least 24-hour notice of start of work under a building permit shall be given to the code official.

## SECTION 113.0 CONDITIONS OF PERMIT

**113.1 Payment of fees:** A permit shall not be issued until the fees prescribed in Section 114.0 have been paid.

**113.2 Compliance with code:** The permit shall be a license to proceed with the work and shall not be construed as authority to violate, cancel or set aside any of

the provisions of this code, except as specifically stipulated by modification or legally granted variation as described in the application.

**113.3 Compliance with permit:** All work shall conform to the approved application and plans for which the permit has been issued and any approved amendments thereto.

**113.4 Compliance with plot plan:** All new work shall be located strictly in accordance with the approved plot plan.

**113.5 Change in site plan:** A lot shall not be changed, increased or diminished in area from that shown on the official plot site plan, unless a revised plan showing such changes accompanied by the necessary affidavit of the owner or applicant shall have been filed and approved; except that such revised plan will not be required if the change is caused by reason of an official street opening, street widening or other public improvement.

#### SECTION 114.0 FEES

**114.1 General:** A permit to begin work for new construction, *alteration*, removal, demolition or other building operation shall not be issued until the fees prescribed in this section shall have been paid to the department of building inspection or other authorized agency of the jurisdiction, nor shall an amendment to a permit necessitating an additional fee be approved until the additional fee has been paid.

**114.2 Special fees:** The payment of the fee for the construction, *alteration*, removal or demolition for all work done in connection with or concurrently with the work contemplated by a building permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law or ordinance for water taps, sewer connections, electrical permits, erection of *signs* and display structures, marquees or other *appurtenant structures*, or fees of inspections, *certificates of use and occupancy* or other privileges or requirements, both within and without the jurisdiction of the department of building inspection.

**114.3 New construction and alterations:** The fees for plan examination, building permit and inspections shall be as prescribed in Section 114.3.1 and the code official is authorized to establish by *approved rules* a schedule of unit rates for buildings and structures of all use groups and types of construction as classified and defined in Articles 1, 3 and 4.

**114.3.1 Fee schedule:** A fee for each plan examination, building permit and inspection shall be paid in accordance with the following schedule.

[JURISDICTION TO INSERT APPROPRIATE SCHEDULES.]

**114.4 Accounting:** The code official shall keep an accurate account of all fees collected; and such collected fees shall be deposited monthly in the jurisdiction treasury, or otherwise disposed of as required by law.

**114.5 Refunds:** In the case of a revocation of a permit or abandonment or discontinuance of a building project, the portion of the work actually completed shall be computed and any excess fee for the incompleting work shall be returned to the permit holder upon written request. All plan examination and permit processing fees

and all penalties that have been imposed on the permit holder under the requirements of this code shall first be collected.

#### SECTION 115.0 INSPECTION

**115.1 Preliminary inspection:** Before issuing a permit, the code official shall, if deemed necessary, examine or cause to be examined all buildings, structures and sites for which an application has been filed for a permit to construct, enlarge, *alter*, repair, remove, demolish or change the use thereof.

**115.2 Required inspections:** After issuing a building permit, the code official shall conduct inspections from time to time during and upon completion of the work for which a permit has been issued. A record of all such examinations and inspections and of all violations of this code shall be maintained by the code official. The owner shall provide for *special inspections* in accordance with Section 1308.2.

**115.2.1 Approved inspection agencies:** The code official shall accept reports of *approved inspection agencies* provided such agencies satisfy the requirements as to qualifications and reliability.

**115.2.2 Plant inspection:** Where required by the provisions of this code or by the *approved rules*, materials or assemblies shall be inspected at the point of manufacture or fabrication in accordance with Section 1301.3.

**115.3 Final inspection:** Upon completion of the building or structure, and before issuance of the *certificate of use and occupancy* required in Section 119.0, a final inspection shall be made. All violations of the approved plans and permit shall be noted and the holder of the permit shall be notified of the discrepancies.

**115.4 Right of entry:** In the discharge of duties, the code official or authorized representative shall have the authority to enter at any reasonable hour any building, structure or premises in the jurisdiction to enforce the provisions of this code.

**115.5 Coordination of inspections:** Whenever in the enforcement of this code or another code or ordinance, the responsibility of more than one code official of the jurisdiction is involved, it shall be the duty of the code officials involved to coordinate their inspections and administrative orders as fully as practicable so that the owners and occupants of the structure shall not be subjected to visits by numerous inspectors nor multiple or conflicting orders. Whenever an inspector from any agency or department observes an apparent or actual violation of some provision of some law, ordinance or code not within the inspector's authority to enforce, the inspector shall report the findings to the code official having jurisdiction.

#### SECTION 116.0 WORKMANSHIP

**116.1 General:** All work shall be conducted, installed and completed in a workmanlike and acceptable manner so as to secure the results intended by this code.

## SECTION 117.0 VIOLATIONS

**117.1 Unlawful acts:** It shall be unlawful for any person, firm or corporation to erect, construct, *alter*, extend, repair, remove, demolish, use or occupy any building or structure or equipment regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.

**117.2 Notice of violation:** The code official shall serve a notice of violation or order on the person responsible for the erection, construction, *alteration*, extension, repair, removal, demolition, use or occupancy of a building or structure in violation of the provisions of this code, or in violation of a detail statement or a plan approved thereunder, or in violation of a permit or *certificate* issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.

**117.3 Prosecution of violation:** If the notice of violation is not complied with promptly, the code official shall request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation or to require the removal or termination of the unlawful use of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.

**117.4 Violation penalties:** Any person who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, construct, *alter* or repair a building or structure in violation of an approved plan or directive of the code official, or of a permit or *certificate* issued under the provisions of this code, shall be guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT], or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment. Each day that a violation continues shall be deemed a separate offense.

**117.5 Abatement of violation:** The imposition of the penalties herein prescribed shall not preclude the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction or to restrain, correct or abate a violation, or to prevent illegal occupancy of a building, structure or premises or to stop an illegal act, conduct, business or use of a building or structure on or about any premises.

## SECTION 118.0 STOP WORK ORDER

**118.1 Notice to owner:** Upon notice from the code official that work on any building or structure is being prosecuted contrary to the provisions of this code or in an unsafe and dangerous manner, such work shall be immediately stopped. The stop work order shall be in *writing* and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work; and shall state the conditions under which work will be permitted to resume.

**118.2 Unlawful continuance:** Any person who shall continue any work in or about the structure after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe conditions, shall be liable to a fine of not less than [AMOUNT] or more than [AMOUNT].

## SECTION 119.0 CERTIFICATE OF USE AND OCCUPANCY

**119.1 New buildings:** A building or structure hereafter erected shall not be used or occupied in whole or in part until the *certificate of use and occupancy* shall have been issued by the code official.

**119.2 Buildings hereafter altered:** A building or structure hereafter enlarged, extended or *altered* to change from one use group to another or to a different use within the same use group, in whole or in part, and a building or structure hereafter altered for which a *certificate of use and occupancy* has not been heretofore issued, shall not be occupied or used until the *certificate* shall have been issued by the code official, certifying that the work has been completed in accordance with the provisions of the approved permit. Any use or occupancy, which was not discontinued during the work of *alteration*, shall be discontinued within 30 days after the completion of the *alteration* unless the required *certificate* is secured from the code official.

**119.3 Existing buildings:** Upon *written* request from the owner of an existing building or structure, the code official shall issue a *certificate of use and occupancy*, provided that there are not violations of law or orders of the code official pending, and it is established after inspection and investigation that the alleged use of the building or structure has heretofore existed. This code shall not require the removal, *alteration* or abandonment of, or prevent the continuance of, the use and occupancy of a lawfully existing building or structure, unless such use is deemed to endanger public safety and welfare.

**119.4 Changes in use and occupancy:** After a *change of use* has been made in a building or structure, the reestablishment of a prior use that would not have been legal in a new building of the same type of construction is prohibited unless the building complies with all applicable provisions of this code. A change from one prohibited use, for which a permit has been granted, to another prohibited use shall be deemed a violation of this code.

**119.5 Temporary occupancy:** Upon the request of the holder of a permit, the code official shall issue a temporary *certificate of occupancy* for a building or structure, or part thereof, before the entire work covered by the permit shall have been completed, provided that such portion or portions will be occupied safely prior to full completion of the building or structure without endangering life or public welfare.

**119.6 Contents of certificate:** When a building or structure is entitled thereto, the code official shall issue a *certificate of use and occupancy* within ten days after *written* application. The *certificate* shall certify compliance with the provisions of this code and the purpose for which the building or structure will be used in its several parts. The *certificate of use and occupancy* shall specify the use group, in accordance with the provisions of Article 3; the type of construction as defined in Article 4; and any special stipulations and conditions of the building permit.

## SECTION 120.0 UNSAFE STRUCTURES

**120.1 Right to deem unsafe:** All buildings or structures that are or hereafter shall become unsafe, unsanitary or deficient in adequate *means of egress* facilities, or

which constitute a fire hazard, or are otherwise dangerous to human life or the public welfare, or which involve illegal or improper use, occupancy or maintenance, shall be deemed unsafe buildings or structures. All unsafe structures shall be taken down and removed or made safe and secure, as the code official deems necessary and as provided for in this section. A vacant building, unguarded or open at door or window, shall be deemed a fire hazard and unsafe within the meaning of his code.

**120.2 Examination and record of damaged structure:** The code official shall examine every building or structure reported as dangerous, unsafe structurally or constituting a fire hazard, and shall cause the report to be filed in a docket of unsafe structures and premises; the report shall state the use of the structure and the nature and estimated amount of damages, if any, caused by collapse or failure.

**120.3 Notice of unsafe structure:** If an unsafe condition is found in a building or structure, the code official shall serve on the owner, agent or person in control of the building or structure a *written notice* describing the building or structure deemed unsafe and specifying the required repairs or improvements to be made to render the building or structure safe and secure, or requiring the unsafe building or structure or portion thereof to be demolished within a stipulated time. Such notice shall require the person thus notified to declare immediately to the code official acceptance or rejection of the terms of the order.

**120.4 Restoration of unsafe structure:** A building or structure condemned by the code official is permitted to be restored to a safe condition provided that *change of use* or occupancy is not contemplated nor compelled by reason of such reconstruction or restoration; except that if the damage or cost of reconstruction or restoration is in excess of 50 percent of its replacement value, exclusive of foundations, such structure shall be made to comply in all respects with the requirements for materials and methods of construction of structures hereafter erected.

**120.5 Posting unsafe notice:** If the person addressed with an unsafe notice cannot be found within the city after diligent search, then such notice shall be sent by registered or certified mail to the last known address of such person; and a copy of the unsafe notice shall be posted in a conspicuous place on the premises; and such procedure shall be deemed the equivalent of personal notice.

**120.6 Disregard of unsafe notice:** Upon refusal or neglect of the person served with an unsafe notice to comply with the requirements of the order to abate the unsafe condition, the legal counsel of the jurisdiction shall be advised of all the facts and shall institute the appropriate action to compel compliance.

#### SECTION 121.0 EMERGENCY MEASURES

**121.1 Vacating structures:** When, in the opinion of the code official, there is actual and immediate danger of failure or collapse of a building or structure or any part thereof which would endanger life, or when any structure or part of a structure has fallen and life is endangered by the occupation of the building or structure, the code official is hereby authorized and empowered to order and require the inmates and occupants to vacate the same forthwith. The code official shall cause to be

posted at each entrance to such building a notice reading as follows: "This Structure is Unsafe and its Use or Occupancy has been Prohibited by the Code Official." It shall be unlawful for any person to enter such building or structure except for the purpose of making the required repairs or of demolishing the same.

**121.2 Temporary safeguards:** When, in the opinion of the code official, there is actual and immediate danger of collapse or failure of a building or structure or any part thereof which would endanger life, the code official shall cause the necessary work to be done to render such building or structure or part thereof temporarily safe, whether or not the legal procedure herein described has been instituted.

**121.3 Closing streets:** When necessary for the public safety, the code official shall temporarily close sidewalks, streets, buildings and structures and places adjacent to such unsafe structures, and prohibit the same from being used.

**121.4 Emergency repairs:** For the purposes of this section, the code official shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

**121.5 Costs of emergency repairs:** Costs incurred in the performance of emergency work shall be paid from the treasury of the jurisdiction on certificate of the code official. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe building or structure is or was located for the recovery of such costs.

#### SECTION 122.0 POSTING STRUCTURES

**122.1 Posted use and occupancy:** Every building and structure and part thereof designed for Use Groups B, F, H, M and S as defined in Article 3 shall be *posted* on all floors by the owner with a suitably designed placard in a form designated by the code official. The placard shall be securely fastened to the structure in a readily visible place, stating the use group, the *live load* and the occupant load.

**122.2 Posted occupant load:** Every room or space constituting a place of assembly or education shall have the approved occupant load of the room or space *posted* in a conspicuous place, near the main *exit* from the room or space. The approved occupant load signs shall be installed and maintained in a legible manner by the owner or an authorized agent. The signs shall be durable and shall indicate the number of occupants permitted for each room or space use. Place of assembly rooms or spaces which have multiple-use capabilities shall be *posted* for all such uses.

**122.2.1 Occupant load calculations:** The occupant load calculations shall be determined in accordance with Section 806.0. The fire prevention code official shall be informed in *writing* of the calculated occupant load.

**122.3 Replacement of posted signs:** All *posted* signs shall be furnished by the owner and shall be of permanent design. Such signs shall not be removed or defaced and, if lost, removed or defaced, shall be immediately replaced.

**122.4 Periodic inspection:** The code official shall periodically inspect all existing buildings and structures, except those of Use Group R-3 and *dwelling units* in buildings of Use Group R-2, for compliance with the law in respect to *posting*, or the

code official shall accept the report of such inspection from an approved licensed professional engineer or architect. Such inspection and report shall specify any violation of the requirements of this code in respect to the *posting* of floor load, occupant load and use group of the building.

### SECTION 123.0 BOARD OF SURVEY

**123.1 Application for survey:** The owner of a building or structure or a duly authorized representative who has been served with an unsafe order and notice to make such structure safe, secure or habitable or to take down and remove such structure shall have the right, except in cases of emergency, to demand the appointment of a board of survey if that person deems such order to be unnecessary, improper or unreasonable. Such demand shall be in *writing* with a statement of the reasons therefor.

**123.2 Composition of board of survey:** The board of survey shall consist of three persons, one of whom shall be the code official or an assistant designated by the code official. Another one shall be the owner or legal representative, or a licensed professional engineer or architect, or a qualified builder designated by the owner, and the third shall be a licensed professional engineer or architect chosen jointly by the other two members, or designated by a justice of the court of record in case of failure of agreement.

**123.3 Compensation of board of survey:** The third member of the board shall receive for services a fee of [AMOUNT] dollars to be paid by the appellant.

**123.4 Survey procedure:** The powers and duty of the board of survey shall be as indicated by Sections 123.4.1 and 123.4.2.

**123.4.1 Inspection of structure:** To inspect the building or structure and to confirm, modify or revoke the order of the code official as is just and proper in the interest of public safety and welfare.

**123.4.2 Determination of repair cost:** To determine the suitable cost of reconstruction, restoration or rehabilitation in the repair of an unsafe building or structure, in case of disagreement or dispute.

**123.5 Board of survey report:** The board of survey shall determine its findings and submit a report in *writing* affirming or modifying the order of the code official in whole or in part and recommending the remedial steps to be taken to render the building or structure safe.

**123.5.1 Method of decision:** The findings and determinations of any two members of the board shall be deemed conclusive and certified copies of the report shall be filed with the code official and with the owner or owner's representative and shall be binding upon the code official and all parties in interest.

### SECTION 124.0 MEANS OF APPEAL

**124.1 Application for appeal:** Any person shall have the right to appeal to the board of appeals from a decision of the code official refusing to grant a modification to the provisions of this code covering the manner of construction or materials

to be used in the erection, *alteration* or repair of a building or structure. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equivalent form of construction can be used.

**124.2 Membership of board:** The board of appeals shall consist of five members appointed by the chief appointing authority as follows: one for five years, one for four years, one for three years, one for two years, and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

**124.2.1 Qualifications:** Each member shall be a licensed professional engineer or architect; or a builder or superintendent of building construction with at least ten years experience, five of which shall have been in responsible charge of work. Not more than two members shall be from the same profession or occupation, and at least one professional engineer shall be a structural or civil engineer with architectural engineering experience.

**124.2.2 Alternate members:** The chief appointing authority shall appoint two alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for five years or until a successor has been appointed.

**124.2.3 Chairman:** The board shall annually select one of its members to serve as chairman.

**124.2.4 Disqualification of member:** A member shall not hear an appeal in which that member has any personal, professional or financial interest.

**124.2.5 Secretary:** The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

**124.2.6 Compensation of members:** Compensation of members shall be determined by law.

**124.3 Notice of meeting:** The board shall meet upon notice from the chairman, within ten days of the filing of an appeal, or at stated periodic meetings.

**124.4 Open hearing:** All hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

**124.4.1 Procedure:** The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence but shall mandate that only relevant information be received.

**124.5 Postponed hearing:** When five members are not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

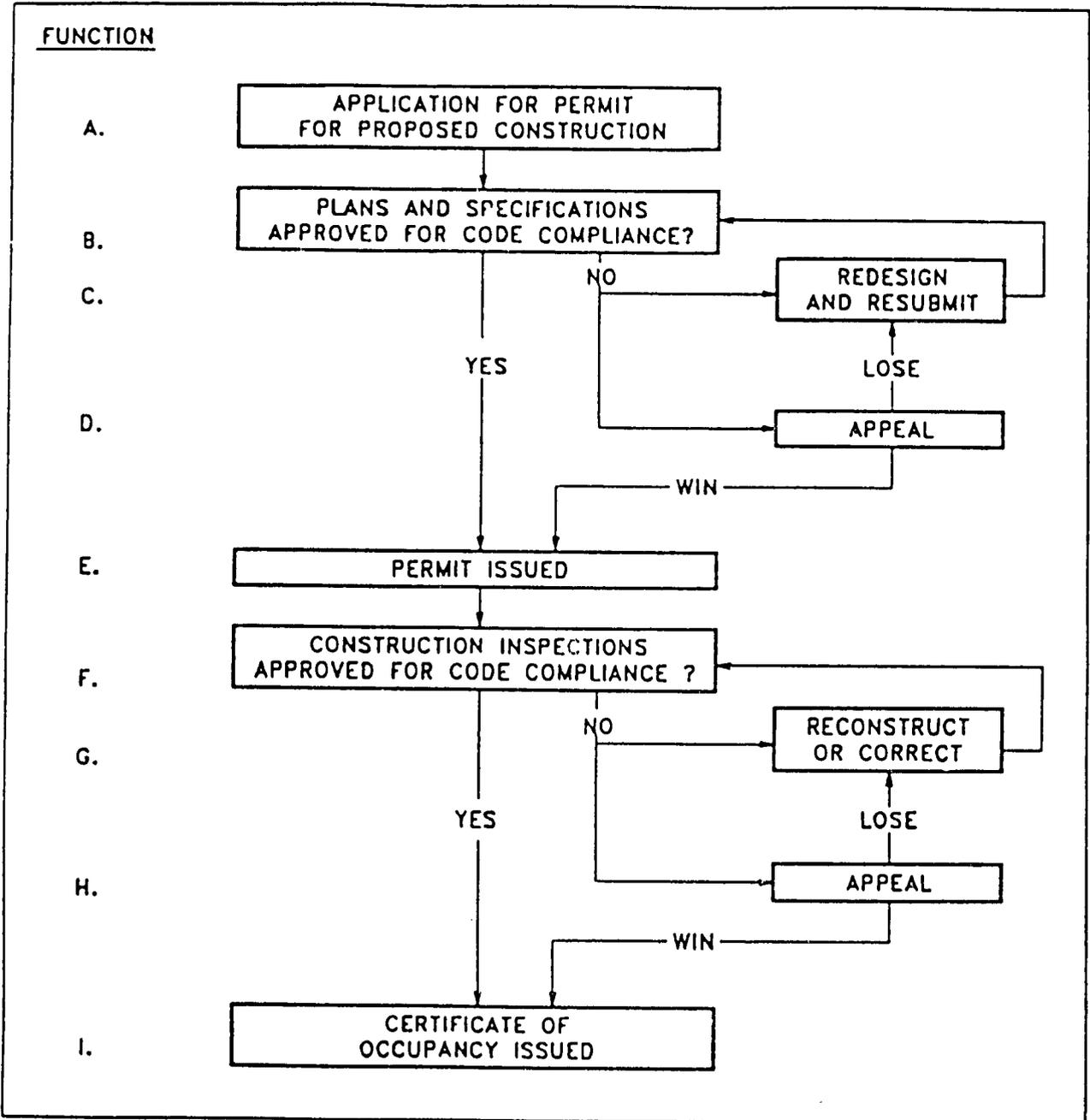
**124.6 Board decision:** The board shall modify or reverse the decision of the code official by a concurring vote of three members.

**124.6.1 Resolution:** The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

**124.6.2 Administration:** The code official shall take immediate action in accord with the decision.

**124.7 Court review:** Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

**ATTACHMENT E**  
**TYPICAL CONSTRUCTION PERMIT PROCESS**



**TYPICAL CONSTRUCTION PERMIT PROCESS  
FUNCTION FLOW CHART**

34