

A FEW ASPECTS ABOUT THE NATIONAL BUILDING CODE

C. CAZACU¹

Abstract: *The buildings are a result of the work done by engineers who know and comply with constructions' rules and regulations. Building codes are a set of rules that specify the minimum standards for constructed. The main purpose of building codes are to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures.*

Key words: *Building codes, state laws, standards for construction, the code of HAMMURABI, accidents on construction, eurocodes*

1. Introduction

Building codes, are municipal and state laws regulating the construction of buildings and prescribing all so the minimum requirements for fire protection, sanitation, and safety. Such laws are intended primarily to set standards for new construction but also to prevent the continued use of buildings.

The oldest collection of laws is dating from the Babylonian king, Hammurabi. The code was probably written around 1760 BC, contained a prologue with 282 law articles and an Epilogue. The text was carved on a diorite stele of 2.25 meters long. It was discovered in 1902 by researcher MJ Morgan during archaeological excavations at Susa. Supposedly it was war booty taken by a conqueror of the Babylonian city. Now it is located in the Louvre (Paris), and a copy of it, is in the Pergamon Museum from Berlin[4].



Fig. 1. *The diorite stele contained the code of HAMMURABI[4]*

The code stressed the point of that the safety of the occupants should be put into consideration during the construction of such building otherwise, heavy penalties

¹ Department of Civil Engineering, Faculty of Constructions, University *Transilvania* of Braşov.

awaits the builder of such a building if the building eventually collapse. The code of HAMMURABI states as follows[4]:

- if a man builds for another and the building collapse and kills the owner, the builder will be put to death;
- if the building kills the son of the owner, the son of the builder will be put to death;
- if the building destroys the property of the owner, the builder will replace the damaged property;

All together we should mention that this set of rules called the Code of Hammurabi was not something extraordinary at that time: three hundred years earlier Sumerian king Ur-Nammu had taken a similar collection of laws, and 150 years before Hammurabi, king of Isin, named Ishtar, had ordered the inscription of a star similar. But the two Sumerian law codes were preserved only fragmentary.

2. Accidents on construction

International Dictionary of Contemporary English present accidents like some happenings or events that happen unexpectedly, accidentally or inadvertently, unpleasant and harmful. Accidents on construction sites cannot be over emphasized, might happen as a result of a mistake or by natural disasters.

3. Health and safety on construction

Health as defined by Long man's Dictionary of Contemporary English is a state of being well in body and mind and free from disease while Safety is described by the same dictionary as a condition of being free from danger, harm or risk. Bokinni (2006) on the other hand describe Safety as a control of recognized hazards to attain an acceptable level of risk.

Naturally, the effect of construction on safety, health and the surrounding environment would vary from particular operations starting with extraction of building materials from quarries and methods by which the extraction is occurring, transportation, preparation of building materials at site and construction of works processes.[5]

Health and safety in building construction projects should be a major concern for everybody in the construction industry, but it is a pity that it in some parts of the world (example in Africa-Nigeria), enough attention is not been given to the issue.

In the civil and building construction works which involve excavation, demolition, concrete work, painting, roofing, operation of machines, plant and equipment, use of hand tools and many other operations call for attention from relevant authorities, regulatory bodies, societies, scientists, professionals and businessmen to establish safety and health management programs and laws governing construction works activities.[5]

Health and safety is an inevitable aspect of construction and this is so because the only time an employee will perform his duties is when he is in good health and is sure of a safety working condition.

One of the most important things that an employer should provide to his employees is safety even at a low risk site. At sites where heavy machinery is being used; it is certain that the level is higher because of the mechanical movement of parts of such machinery and therefore for the employee that will be monitoring or operating such machinery will be exposed to accidents. In a case like this, it should be known that the level of safety that will be provided will be much more than that of a site where ordinary hand tools are been used. Based on the above, we now understand that the level of Safety and Health protection will

be higher nowadays because of the rapid mechanization of the construction industry and the accidents that may occur will definitely be more fatal. [1]

3.1. The European building code

The idea of cooperation and then the economic integration of Europe appeared first time in 1923, with the beginning of the pan-European movement, and evolved rapidly after the second world war through the creation of various organizations with different business objectives, like: Union of European Federalists (1946), European League for Economic Cooperation (1947), The Marshall Plan (1948-1952), the Organization for European Economic Cooperation (1948), the, NATO (1949), the Council of Europe (1949,Strasbourg), the Economic Community of Coal and Steel (1951). [1]

Conditions for establishment and operation principles of the European Economic Community, (EEC) or simply the European Union (EU), was established by the Treaty of Rome in 1957. The agreement became available starting in 1959. Activities of this organization are coordinated three units:

- The European Parliament;
- The European Union Council;
- The European Commission.

The main objectives of European Union are to promote a continuous development, harmonious and balanced the member countries, the creation of a common market, agreeing to legislation that would make possible the functioning of the common market, the elimination of customs duties, freedom of movement for goods, persons, services and capital, creating jobs, etc.

Since 1985 the EU's founding treaty was amended and supplemented by a series of decisions by the EU Council in order to create the European Single Market. On this

occasion, founded initiating the process of harmonization at community level of technical rules and standards that premise to eliminate existing restrictions on the free movement of goods and services.

The common market in the EU has officially appeared in 1993, on which occasion the harmonization of existing regulations in member countries and turning them in new European rules has become a priority.

Construction market as part of the EU internal market - where the competition to be able to express freely - has a significant share and hence the important regulatory system attributed to construction in order to the proper conduct of activities in this sector.

Harmonization of technical base for designing buildings but also for the range, quality and performance of materials, designers need to ensure the growth and preparation of projects, technical barriers and commercial building industry, treating in the same way allover European countries of different types of structures, materials and products. A state member or member of the common market must not only be able to create conditions for the production of construction products in according to EU standards, but must be able to ensure that all products placed on the market (projects, materials, equipment) are substandard. This means not only adapt by all states member of appropriate legislation but to and create the necessary structures, techniques, for implementation of the new legislation. These structures testing laboratories, research institutes, metrology institutes, must win the confidence of the european community in its entirety.

In terms of legal measures, the harmonize technical regulations system were ordered mainly by two acts of the Council of the European Union, namely:

- Public Works Directive 89/440 / EEC;

- Construction Products Directive (CPD), 89/106 / EEC. [1]

These acts establish the functioning market principles in building area and the production of technical construction standards, and also how to relate and interpretation of laws, regulations and decrees of the European Union member states.

The importance of guidelines is the fact that are based on a new and modern approach of all the construction sector activities, which consists in providing for a product or a group of products (materials, components, structures and overall) a number of key or essential requirements. Those are the six essential requirements:

- strength and stability;
- safety in operation;
- fire safety;
- hygiene, human health, rehabilitation and environmental protection;
- thermal insulation and waterproof, energy economy and heat retention;
- protection against noise.

Corresponding to the six basic requirements European level have been developed six performing document name, Interpretative Documents,(ID), detailing requirements for design and construction products. In according to these documents, legislation must relate mainly to:

- technical regulations on building design;
- rules based on the quality of materials and products used in construction projects;
- specifications on technical approvals for new products, equipment, materials, processes.

European Union Council decided that the development of the european system of regulations and technical rules to deal with three of the most important standards organizations:

- European Committee for Standardization (CEN);
- European Committee for Electro-

technical Standardization (CENELEC);

- European Telecommunications Standards Institute (ETSI).

In present there are over 5.000 European standards and It is expected that the final of these project European standards entirely replace the national standards of each country.

The initiative for elaboration of international rules for the structural resistance design in constructions started in 1974 and it was is based on the good cooperation between technical and scientific organizations having the professional activity recognized on the European field. These organizations are[1]:

- IABSE = International Association for Bridge and Structural Engineering;
- CEB = International Committee for Concrete;
- RILEM = International Association of the Testing and Research Laboratories for Materials and Constructions;
- FIP = International Federation for Prestressed Concrete;
- ECCS European Convention for Constructional Steelworks;
- JCSS Joint Committee on Structural Safety;
- ISSMFE International Society for Soil Mechanics and Foundation Engineering;

The basic rules for structures design were developed in the Joint Committee on Structural Safety (JCSS). With these basic rules were made the safety and operating conditions based on the concept of risk but also taken into account the criteria of reliability of structures. All these conditions ensured the common basis of design and calculation rules, creating all the necessary requirements for drafting the structural eurocodes. All these conditions ensured the common basis of design rules, creating also the necessary prerequisites to elaborate the structural Eurocodes. In this

way EU aimed to harmonize the principles rules of all participating States with respect at construction materials, methods of construction, types of buildings and civil engineering.

Eurocode program provides, in a coherent and comprehensive system of rules, various design methods and other specific design elements very important in construction practice, including all types of buildings and civil engineering constructions, made from different materials. Generally all the eurocodes are based on reference standards of the International Organization for Standardization (ISO) and the provisions from a Eurocode are structured in articles or different paragraphs like: basic principles and application rules. These basic principles and application rules include:

- definitions and general statements for which there is no other alternative;
- requirements, models and analytical methods for which no alternative are allowed except as the one stipulated expressly[3].

Application rules represent special rules that are recognized by everyone, and these rules follow the principles and the requirements that every country agree.

3.2. The National building code

Recommendations on harmonization the Romanian rules with the Eurocodes.[1]

The responsibility for proper conduct of the buildings principally rests to the state building. Therefore the responsible organism must be involved in the conception activities of design, construction and operation of buildings. State involvement is materialized by the fact that these activities must be conducted in accordance with legal and technical regulations that must be followed unconditionally.

In our country technical building rules have been unit treated by the Ministry of Public Works, Transport and Housing, MLPTL, coordinated by the General Directorate of Technical.

There were formed specialized committees, based on the Law no. 10/1995 (the quality of construction rules) that have the following obligations to meet the following requirements:

- elaborating the technical regulations for construction quality and components system;
- technical approval for products, processes and equipment;
- certification of conformity for the quality products used in construction.

In November 1997 the Rumanian Ministry of Public Works launches the Romanian Codes (CR) for "elaborating the technical regulations for civil and industrial structures valid in the period 1997-2000 and the harmonization of all Rumanian technical rules with the European Union one".

CR program elements have been defined, in principle, in accordance with Eurocodes 1-9, and the basic idea being that they soon become National Application Documents (DAN), that content the entirely text of Eurocode with proper adjustments based on the Romanian version situation from our country. The document containing the proper adjustments based on the national version situation from every country it's named the national annex. The national annex may only contain information on those parameters from Eurocode defined as parameters to be determined at national level. And these parameters can be:

- Values and / or classes where Eurocodes provides national alternatives;
- Values that can be used in case that Eurocode do not provide the value of the parameter indicating only it's symbol;
- Country specific data (geographical, climatic), as zoning map for snow load;

The procedure that can be used when Eurocode submit other alternative procedures.

4. Conclusions

The construction build codes are of great importance in construction of buildings and should be backed by an action of wide distribution and explain to the engineers who will apply them and must be tangent to other existing national building codes. Building code requirements generally apply to the:

- construction of new buildings;
- alterations or additions to existing buildings;

- changes in the use of buildings;
- the demolition of buildings or portions

of buildings at the ends of their useful or economic lives.

The building code also elaborates on the blueprint details with regards to access for the disabled, and stability of the structure to deal with tremors and violent external forces. When any constructor design adopts one eurocode, it automatically also adopts the sections of the other referenced codes like the plumbing, mechanical, and electric codes. Building codes are generally applied to new constructions, and

alterations or additions to existing structures. Many a time, changes in the use of a building expose the entire structure to adopt the code. [3]

The National Building Code, if are properly followed and implemented, will provide the construction of all forms of unsafe acts, unsafe working condition or unsafe process of construction.

Reference

1. Ciongradi I., *The harmonization of Romanian structures codes with European standards (Eurocodes)*, Universitatea Tehnica Gh.Asachi, Iasi.
2. Trombly B., *The international building code (IBC)*, CMGT 564- Term paper, 2 august 2006.
3. *The National Conference in standardization, Romania Standards Association*, internet article "Eurocodes", seventh edition, 14.10. 2013.
4. *Knowledge adventure, The Hamurabi code*, (Aventura cunoasterii "Codul lui Hamurabi"), internet article, accessed 15.10. 2012.
5. *National Building Code and Construction Health and Safety in Nigeria*, internet article, accessed 15.09. 2014, at www.scrib.com