

Hanoi, 14 December, 1996

**DECISION OF MINISTER OF CONSTRUCTION
ON PROMULGATING THE BUILDING CODE OF VIETNAM**

MINISTER OF CONSTRUCTION

- Pursuant to Decree No 15/CP dated 4 March, 1994 of Government regulating on Functions, Duties, Powers and Organization Structures of Ministry of Construction;
- Pursuant to Decree No 42/CP dated 16 July, 1996 of Government promulgating the Regulation on Investment and Construction Management;
- In consideration of requests on planning and construction management, on a proposal from Head of Department for Construction Policy, Head of Department for Architecture and Planning Management, Director of Institute for Architecture and Standardization, Director of Institute for Urban and Rural Planning

DECISIONS

Article 1: To promulgate in attachment with this Decision the Building Code of Vietnam- Volume I (General provisions and Construction Planning).

Article 2: This Decision takes effect from 1 January, 1997 and is applied in the Whole Country.

Article 3: Ministries, ministerial level Bodies, Bodies under Government, People's Committee of provinces and cities under direct Central Authority shall be responsible to organize the implementation of this Decision.

Ngo Xuan Loc
Minister of Construction
(Signed and Sealed)

TABLE OF CONTENTS

PART I	GENERAL PROVISIONS	167
CHAPTER 1	GENERAL PROVISIONS OF THE BUILDING CODE	169
Article 1.1.	Scope of application of the building code	169
Article 1.2	Terminology	169
Article 1.3.	Objectives of the building code	170
Article 1.4.	Technical requirements of the building code	170
Article 1.5	Deemed- to - satisfy technical solutions	171
Article 1.6	Application of international and foreign standards	171
CHAPTER 2	DATA ON NATURAL CONDITIONS USED FOR CONSTRUCTION DESIGN	173
Article 2.1.	Data on natural conditions in the construction zone	173
Article 2.2	Survey of construction sites	173
NOTE:	The list of existing Vietnamese standards related to the technical survey of construction sites has and is being annually published in "List of Vietnamese Standards on Construction" by Ministry of Construction.	175
CHAPTER 3	GENERAL TECHNICAL CONDITIONS FOR DESIGNING OF CONSTRUCTION WORKS	175
Article 3.1.	General requirements with respect to construction works	175
Article 3.2.	Planning and architectural designing	175
Article 3.3.	Protection of natural resources and environment	176
Article 3.4.	Precautions against fire and explosion	176
Article 3.5.	Structural safety	177
Article 3.6.	Precautions against earthquakes	178
Article 3.7.	Anti-corrosion measures	179
Article 3.8.	Water-proofing measures	180
Article 3.9.	Protection measures against lightning	181
Article 3.10	Thermal- protection	183
Article 3.11	Protection against harmful biological substances	184
Article 3.12.	Protection against excessive noise and vibration	185
Article 3.13	Hygiene and amenity	185
PART II	CONSTRUCTION PLANNING	187
CHAPTER 4	GENERAL PROVISIONS ON CONSTRUCTION PLANNING	189
Article 4.1.	Scope of application	189
Article 4.2.	Terminology	189
Article 4.3.	Requirements for construction planning	189
Article 4.4.	Protection area of works and buffer zones for hygiene and safety.	192
Article 4.5	Protection areas of dykes.	192
Article 4.6.	Protection areas of water conservancy works.	195
Article 4.7	Protection areas of transport works	196
Article 4.8.	Protection corridors of high tension power network	201

GENERAL PROVISIONS OF THE BUILDING CODE

Article 1.1. Scope of application of the building code

The Building Code of Vietnam (hereinafter referred to as BCV) is a paralegal document which stipulates the minimum technical requirements mandatory to all construction activities, the solutions and the standards that must be applied in order to satisfy the above-mentioned requirements.

Note:

1. Cases involving limits to application of the BCV, if any, are to be stipulated in specific chapters.
2. In the Building Code all paragraphs written in vertical characters are mandatory, while paragraphs in italics contain guidance provisions and deemed-to-satisfy provisions. (See Art. 1.4.)
3. The BCV is the technical basis for setting, designing, assessing and approving of planning projects, designs of construction works, inspection of construction process, acceptance of construction works and the occupancy thereof.
4. The BCV only comprises stipulations relating to technical matters in construction, and does not include stipulations relating to administrative procedure and control of building, public order and hygiene.

Article 1.2 Terminology

In the BCV, the following terms are understood as follows:

1.2.1 Construction activity

Construction activities include all technical activities that relate to construction projects and cover two major steps of:

- 1) Construction planning: - comprises the preparation of construction planning schemes and construction management in accordance with planning schemes.
- 2) Investment and construction: - comprises the preparation of investment project documentation, site survey, design, the act of construction (including reparation, renovation and demolition) and maintenance of construction works.

1.2.2 Vietnamese standards

Vietnamese standards are standards issued in Vietnam, which comprise:

- 1) The National standards with TCVN as a code-name;
- 2) Building standards with TCXD as a code-name;
- 3) Ministerial standards, with TCN as a code-name.

Articles 1.3. Objectives of the building code

The objectives of the BCV are to ensure complete efficiency of all newly constructed or renovated urban centres, residential areas, industrial zones and construction projects as follows:

1. To ensure the safety, hygiene and amenity conditions for occupants of urban areas, constructed or renovated buildings;
2. To protect interests of the whole society, including:
 - a) Protection of living environment, landscape, and historical and cultural relics; preservation and development of national culture identity;
 - b) Protection of public property: buildings and within assets;
 - c) Satisfaction of requirements for national defence and security.
3. To use investment capital, land and other resources in a rational manner.

Article 1.4. Technical requirements of the building code

Regarding a view to achieve the objectives as mentioned in Article 1.3, all construction activities must satisfy technical requirements as mentioned in the following chapters, namely:

1. Planning schemes must satisfy the requirements of land use, environment and health protection, with due regard to personal safety and amenity .
2. Project design and performance must comply with the minimum requirements on safety, hygiene and amenity for the occupants.
3. During construction the minimum requirements on labour safety, environment and landscape protection must be met.

Article 1.5 Deemed- to - satisfy technical solutions

1.5.1 Requirements of technical solutions

1. Technical solutions proposed for planning, designing and implementing construction works are approved only when they meet the technical requirements as stipulated in the BCV.
2. In renovation of existing works, where the circumstances do not allow strict compliance with the BCV, appropriate solutions must meet the technical requirements of this Code to the maximum extent possible.

1.5.2 Deemed- to- satisfy solutions are:

1. Solutions that are specified in this Code;
 - a. These solutions are based on a number of existing Vietnamese standards which are adopted by the BCV. When an existing standard is replaced by an approved standard, the replacing standard is automatically adopted by the BCV.
 - b. If there is a difference between the BCV and adopted standard(s), compliance to the requirements of the BCV shall prevail or
2. Any solution that is not mentioned in the BCV but regarded by the competent authority concerned as in keeping with the BCV.

Note:

Usually, these solutions are based on international or foreign standards which are acceptable in accordance with Article 1.6

- 1.5.3 The standard designs of construction components, details and or elements as issued by the Ministry of Construction are regarded as deemed- to-satisfy technical solutions, which need not be assessed when applied to the construction designs.

Article 1.6 Application of international and foreign standards

International and foreign standards can be applied to surveying, designing and implementation of construction projects in Vietnam if they meet the technical requirements as stipulated in the BCV and are accepted by the Ministry of Construction.

Note:

1. The Ministry of Construction (in Circulars No. 12/BXD-KHCN dated April 24, 1995 and 78/BXD-KHCN dated July 17, 1995) has accepted and allowed application of existing construction standards of the International Standards Organization (ISO) and of Great Britain, Germany, USA, Japan, France and Australia, except for following fields:
 - a) Data : Climatic data, hydro-geological data for construction
 - b) Precautions against explosions, fire, wind, cyclones, lightning
 - c) Environmental hygiene
 - d) Safety of construction projects regarding local climatic impact
 - e) Labour safety
2. In applying international and foreign standards in Vietnam, care in comprehension of the standards is required. In certain instances, it maybe necessary to adapt such standards to make them more suitable for the natural, social, economical and technical conditions of Vietnam.

DATA ON NATURAL CONDITIONS USED FOR CONSTRUCTION DESIGN

The focus of this Chapter is to ensure that urban planning schemes and the design of projects are appropriate to the natural conditions of Vietnam.

Article 2.1. Data on natural conditions in the construction zone

Data on natural conditions in the construction zone used for planning and design must comply with the following data:

1. Data mentioned in existing Vietnamese standards; or
2. Data supplied by the Vietnamese competent state agencies in case where no corresponding Vietnamese standards is available

Note:

1. With respect to data on natural conditions, the following standards are available:
 - a) TCVN 4088-85 "Climatological data used in construction designing,".
 - b) TCVN 2737-95 "Loads and impact,".
2. *With respect to other data on natural conditions, it is acceptable to refer to "BCV- Volume 3- Appendix- Data on natural conditions of Vietnam"*

Article 2.2 Survey of construction sites

The technical survey reports of the construction site, including reports on geology, topography, hydro-geology, hydrography, environment impact must be prepared by licenced specialized agencies having the capacity to undertake the survey work in accordance with Vietnamese standards or international or foreign standards that are accepted by the Ministry of Construction.

Note:

The list of existing Vietnamese standards related to the technical survey of construction sites has and is being annually published in "List of Vietnamese Standards on Construction" by Ministry of Construction.

GENERAL TECHNICAL CONDITIONS FOR DESIGNING OF CONSTRUCTION WORKS

The focus of this chapter is to ensure that works are designed in accordance with the natural characteristics, human, social, economic and technical conditions of Vietnam.

Article 3.1. General requirements with respect to construction works

Construction works must meet the following requirements on:

1. Planning and architectural design
2. Structural safety
3. Safety for protection against fire and explosion
4. Hygiene, amenity and other safety conditions for users.

Article 3.2. Planning and architectural designing

3.2.1 Construction site

The proposed construction site must meet the following requirements:

1. It must be in keeping with the approved zone planning scheme (where no zone planning scheme is available, the proposed construction site must be approved by the competent state agency concerned)
2. It must be not located in an area where construction is prohibited (This may be due to protection reasons: environment, natural resources, landscape, relics, infrastructure and defence works), as stipulated in Chapter 4.
3. It must not negatively impact upon the landscape and must not cause pollution beyond the permitted level as stipulated in Chapter 4.
4. It must meet the requirements relating to prevention of fire and explosion, as stipulated in Art 3.4.
5. It must efficiently use land, particularly agricultural land.

3.2.2 Architectural design

The architectural design of a project (including site planning, spatial arrangement, exterior and interior decoration, courtyard and garden disposition) must meet the following requirements:

1. It must be in accordance with regulations on construction management as determined by the local authorities.
2. It must be in keeping with the local climatic conditions, must take full advantage of favourable climatic conditions and limit the impact of unfavourable climatic conditions, for the purpose of natural ventilation and lighting.
3. It must be in harmony with the natural and artificial landscape of the area adjacent to the construction site, and must take full advantage of such factors as existing water surface, green space, and roads.

Article 3.3. Protection of natural resources and environment

Construction works must be designed and constructed:

1. Not to cause adverse effects to the environment: complying with provisions on environment and landscape protection;
2. To protect the natural conservation areas, and historical, cultural, architectural relics;
3. To conserve and efficiently utilize the natural resources in immediate and subsequent development stages;
4. To respect the customs and habits, religious beliefs of people living adjacent to the construction site.

Article 3.4. Precautions against fire and explosion

3.4.1. Construction site

Work on the construction site must meet the following requirements:

1. Limit adverse effects of fire and explosion to population and structures in the neighbouring areas.
2. Make sure that fire fighting means can efficiently operate with safety through the provision of convenient access and regular supply of water for extinguishing a fire.

3.4.2 Construction Work

1. The design, implementation and use of constructed works must meet the following requirements:
 - a) Prevent risks of fire and explosion; using materials and components which have fire-resistant levels that are appropriate to the functions and size of the construction.

- b) Isolate explosive and flammable materials from all sources of fire and explosion.
- c) Take appropriate precaution measures against fire and explosion with respect to:
 - i) Adequate equipment for detecting and warning
 - ii) Safety and timely exit of all occupants from buildings
 - iii) Prevent spreading fires and explosion
 - iv) Have adequate, appropriate and efficient fire fighting equipment.
- 2. The requirements and solutions for fire prevention and fighting to buildings are stipulated in Chapter 11

Article 3.5. Structural safety

3.5.1 General requirements

- 1. The construction must ensure safety and serviceability during the period of construction and throughout its proposed life as follows:
 - a. The stability of the structure must be calculated taking into account:
 - i) The most adverse combination of loads, included gradually those that might result in a potential for progressive collapse loads
 - ii) Other impacts, including effect of time
 - b. The construction materials and works must be maintained for their specified use without damage through deformation, vibration, degradation, or other transformation.
- 2. Materials used for construction must be durable and meet the functional requirements as stipulated without requiring replacement during the project design life.
- 3. The requirements and solutions on structural designs for buildings are stipulated in Chapter 9

3.5.2 Loads and impacts

- 1. Loads and impacts used for designing a construction project must comply with the requirements mentioned in Standard TCVN 2737-95 Loads and impacts - Design requirement.

These requirements shall be amended and adjusted in time with the results of surveys and measurements made at specific construction site.

2. Wind loads must be taken into account not only for designing but also during construction.

Note:

Erection in areas affected by cyclones should avoid architectural and structural designs, parts or details of which amplify cyclonic wind or collect rain water as these may create unfavourable auxiliary loads, excessive oscillations and water ponding. Care should be taken to use structural patterns that are aerodynamically efficient as well as traditional structural patterns which could efficiently protect against cyclones.

3.5.3. Precautions against floods

With respect to construction works in coastal and flood prone areas, measures must be taken to ensure the safety of occupants and minimise the risks of damage by floods, collapse, wave impacts or inundations. In all areas, precautions must be made to avoid damage caused by flood, land slide and soil erosion.

Article 3.6. Precautions against earthquakes

3.6.1. Precautions against earthquake activity

For the purpose of earthquake resistance, construction projects are classified into 3 grades:

1. Works under grade I
 - a. Works under grade I are particularly important ones where partial deformation and damage is a critical risk, and every means shall be taken to minimise this risk.
 - b. Works under grade I are designated by a decision of the Prime Minister. They comprise nuclear reactors, major dams (which may lead to serious damage and difficulty in rehabilitation), toxic chemical plants, cultural works with eternal significance, and important fire fighting systems.
 - c. With respect to works under grade I, paraseismic measures must be applied that satisfy design requirements to withstand the maximum grade of earthquakes within any frequency

2. Works under grade II

- a. Works under grade II are those that can allow deformation such as cracking, damage to separate components which do not affect the safety of occupants and equipment.
- b. In designing works under grade II, paraseismic measures must be applied that satisfy design requirements to withstand the grade of earthquake as estimated for each particular case.

3. Works under grade III

- a. Works under grade III are those, when destroyed by earthquakes, would have little possibility to cause loss of life or large economic damage.
- b. Works under grade III comprise one-story residential houses and public buildings, industrial construction containing non-valuable assets, ordinary storehouses and ancillary buildings.
- c. Design of works under grade III are not required to include paraseismic measures.

3.6.2. Earthquake grades

Maximum earthquake grades for a particular construction site are determined in accordance with the local map of seismic zones (see Appendix 2.3. in BCV, Vol. 3) and readjusted in accordance with the soil conditions.

3.6.3. Designing for earthquake

Design calculation for earthquake resistance must be in accordance with the relevant standards.

Note:

As Vietnamese standards on Earthquake Resistance are not available, designers can apply those existing standards of industrially developed countries, which are accepted by the Ministry of Construction.

Article 3.7. Anti-corrosion measures

- 3.7.1. With respect to climatic conditions of Vietnam, all buildings and projects must have appropriate anti-corrosion measures.

3.7.2. The selected anti-corrosion measures must be efficient, long-lasting and economic. The measures designed to protect the structures and projects against the corrosive effects of chemicals or biological elements must be appropriate to the characteristics of the corrosive agents (chemicals, or biological substance emitted by bio-organisms) and neutralise the impact of these agents.

3.7.3. *Deemed-to-satisfy technical solution.*

It is acceptable to apply the following anti-corrosion measures:

1. *With respect to metal structures:*
 - a. *Coating: applied to structures that are exposed to the air.*
 - b. *Coating combined with electro-chemical protection: applied to structures lying in water and underground.*
2. *With respect to reinforced concrete structures and pre-stressed reinforced concrete structures:*
 - a. *Use of the type of cement which is appropriate to the ambient condition.*
 - b. *Take measures to increase the density of concrete, to enhance water- proofing capacity. The thickness of concrete cover must be appropriate to the corrosive ambient condition.*
 - c. *Applying a seal to concrete surface for preventing water penetration.*
 - d. *Protecting reinforcing steel with appropriate electrochemical methods.*
 - e. *High-strength steel cable and tensile wire in pre-stressed concrete structures must be treated for anti-corrosion and inserted in closed channels inside the concrete; they must not be placed in open channels and sealed with cement mortar.*

Article 3.8. Water-proofing measures

3.8.1. Water-proofing measures must be considered in design and during construction.

3.8.2. Water-proofing materials must be selected in line with the characteristics of Vietnam which is a hot and humid tropical climate, having significant rain-fall and generally high underground water level.

3.8.3. *Deemed-to-satisfy technical solutions*

1. *It is acceptable to apply the following water-proofing measures:*
 - a. *A cement solution applied to the surface of the water-proofing concrete layer.*
 - b. *Painting with bituminous rubber.*
 - c. *Plastering with mortar mixed with yellow sand on the concrete surface and covered with thermo-insulation materials.*
2. *It is not permitted to use the following water-proofing solutions and materials:*
 - a. *Painting with bitumen*
 - b. *Sticking bitumen paper or water-proofing rubber paper on the surface of the concrete*
 - c. *Plastering cement mortar without a layer of a thermo-insulation material*

Article 3.9. Protection measures against lightning

3.9.1. Requirements for lightning protection

1. For the purpose of lightning protection, construction projects (with the exception of special projects as mentioned in paragraph 3 below) are classified into 3 grades as stipulated in Table 3.9.1
2. If a construction project requires different lightning protection grades for different sections of the project, it is necessary to take the highest grade as the general lightning protection level of the total project.
3. Construction having special lightning protection requirements as following, must comply with additional regulations on lightning protection by respective agencies:

- a) Stores of explosive materials, petroleum, oil and lubricants.
- b) Power transmission lines, telephone lines; and
- c) Broadcasting towers, antennae for wireless receivers and transmitters.

Table 3.9.I.

Classification of constructions in terms of lightning protection

Classification and lightning protection requirements	Lightning protection grade		
	I	II	III
<p>I. Classification of lightning protection in terms of the characteristics of the constructions.</p> <p>a) Importance: (power plants broadcasting stations, etc.</p> <p>b) Risk of explosion during the process of production:</p> <p> i) Very high (can occur under normal conditions)</p> <p> ii) High (can only occur in unforeseen circumstances)</p> <p>c) Damages caused by an explosion</p> <p> i) Loss of human lives, or significant economical damages</p> <p> ii) No loss of human lives, minor damages only</p> <p>d) Other constructions (I)</p>			
<p>2. Lightning protection requirements:</p> <p>a) Protection against direct lightning strikes.</p> <p>b) Protection against electrostatic reflex and electromagnetic reflex</p> <p>c) Protection against transmission of lightning from external power lines and metallic conduits</p>	<p>+</p> <p>+</p> <p>+</p>	<p>+</p> <p>+</p> <p>+</p>	<p>+</p> <p>0</p> <p>+</p>
<p>3. Requirements on when protection system against direct lightning strikes, electrostatic reflex and electromagnetic reflex become effective:</p> <p>a. At beginning of installation to machinery and equipment</p> <p>b. After completion of construction.</p>	<p>+</p>	<p>+</p>	<p>+</p>

Note:

(1) The following constructions under Grade III do not require protection measures against direct lightning strikes:

a. With a height (from ground level to the highest part of the construction) less than 8 meters and:

i) Having few occupants

ii) Having no large metal structural components or equipment

iii) Located in areas seldom affected by lightning (absence of lightning strikes for more than 5 years)

iv) Where a direct lightning strike would not cause considerable losses of human life or property.

b. Protected by taller surrounding buildings

3.9.2. Lightning protection system

1. An earthing system provided for lightning protection must be compatible with the topographical, geological, meteorological conditions and the characteristics of the construction work.
2. Lightning protection measures must be active when any high metal structure is erected at high level and/or in the open air and when technical equipment are installed inside the constructions. When the lightning protection system is installed, measures must be taken to ensure its effectiveness for safety of occupants, technical equipment and the whole construction in the lightning protected area.
3. The Lightning protection system must be operated immediately after finishing of construction. After installation, the lightning protection system must be tested for the purpose of acceptance. During usage, the system must continually be subject to periodic inspection and maintenance.
4. Lightning protection systems for residential, public and industrial buildings are stipulated in Chapter 10. The Design of lightning protection systems for specialized construction must comply with the lightning protection requirements of the specialized agency concerned.

Article 3.10 Thermal- protection

3.10.1. Protection against heat and cold

- 1) Construction in the Southern Part of Vietnam belonging to the climatic zone B as defined in the climatic zoning map of TCVN 4088-85 Climatological data to be used in construction design" (see Volume 3, Appendix 2.1), requires consideration to be given for heat protection measures in the design.
2. Constructions in the Northern Part of Vietnam belonging to the climatic zone A must be designed for protection against both the heat in summer and the cold in winter.
3. In the highlands (over 1,000 meters above sea level), only protection against the cold is required.

3.10.2 Protection against sunlight

1. Construction requiring heat protection must also consider sunlight protection for various types and sizes of openings. The number and size of West facing openings shall be limited.
2. Sunlight protection must be designed to prevent sunrays from directly radiating into rooms from 9 a.m. to 4.30 p.m. during summer months.

3.10.3 Protection against rain.

Rain protection must prevent wind driven rain penetration through doors and other openings. Design should be based on rainfall, velocity, frequency and main direction of winds during the rainy season, and the orientation of doors and openings.

Article 3.11 Protection against harmful biological substances

- 3.11.1. Materials of plant origin which are used for the processing, production and storage of goods that may suffer from biological attack, must themselves be protected from such biological attack.
- 3.11.2. Structures lying in salt water must be protected against attack from marine borers and shipworms.
- 3.11.3. Protective chemicals and protective methods must not cause environment pollution and must comply with Vietnamese standards.

- 3.11.4. It is prohibited to import and use construction materials which contain harmful biological substances.
- 3.11.5. Protection of construction from termites and wood-boring worms is stipulated in Chapter 10.

Article 3.12. Protection against excessive noise and vibration

- 3.12.1. Construction activity, and the designed use of constructed facilities must not lead to excessive noise or vibration. The maximum permitted level of noise in residential areas is stipulated in Chapter 4.
- 3.12.2. Insulation measures against excessive noise within buildings are stipulated in Chapter 10.

Article 3.13 Hygiene and amenity

- 3.13.1. Construction must be designed to meet hygiene and amenity requirements for intended users, including disabled persons.
- 3.13.2. The hygiene and amenity requirements are stipulated in Chapters 10, 12 and 13.