

Building Control in Japan

- Part A -

- Table of Contents and Abbreviations
- **Part A Basic Structures of Building Control in comparison with Various Countries**

Chapter 1 Subjects of Building Control

Chapter 2 Basic Legal Document and Technical Documents

Chapter 3 Performance-based Solutions

- Part B Background Information
- Part C Building Regulatory System
- Part D Technical Requirements for Building Safety and Amenity (Group A)
- Part E Technical Requirements from the viewpoint of City Planning (Group B)
- Part F Technical Requirements from the viewpoint of Land-development (Group C)
- Annexes (under construction)

Building control system depends on the country.

Before the lecture of the building control system in Japan, this 'Part A' shows:

- (1) Which kinds of subjects are commonly targeted by various countries, and how the subjects can be categorized,
- (2) How the various countries make basic legal document and technical documents in responding to each category of subjects, and
- (3) How the various countries deal with building plans with innovative solutions, such as:
 - a building plan with brand-new building materials,
 - a building plan with brand-new construction method, and
 - a building plan unusual features of design.

Chapter 1

Subjects of Building Control

In many countries, when someone intends to construct a building, it is required to construct and maintain the building in compliance with **technical requirements** prepared by the authorities.

These technical requirements may be categorized into three groups (Group A, B, and C) as shown below.

Group A: Technical requirements from the viewpoint of **building safety and amenity**

Group B: Technical requirements from the viewpoint of **city planning**

Group C: Technical requirements from the viewpoint of **land-development**

Group A: Technical requirements from the viewpoint of **building safety and amenity**

For the purpose to ensure **the building safety and people's amenity**, most countries have authorized building technical requirements, and made them mandatory to buildings in their countries.

Aspects covered by such technical requirements are as shown below (example). The technical requirements of such aspects are adopted by many countries.

Aspects of Technical Requirements of **Group A** (examples)

- **Mechanical safety** (Structural safety) against:
 - dead loads (self-weight, permanent load) and live loads (imposed loads), and
 - external force, such as earthquake vibration, snow load, wind load, landslide, etc.
- **Fire safety measures** including:
 - warning equipment,
 - countermeasures against internal fire spread (linings),
 - structural stability against fire,
 - facilities for escape (stairs, smoke control, etc.),
 - countermeasures against external fire spread (external walls, openings and roofs to resist the spread of fire over from one building to another)(*1), and
 - facilities for the fire service (fire service access, fire-extinguishing equipment, etc.)

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- Resistance to **contaminants**,
- Resistance to the **passage of sound**,
- **Ventilation, sanitation, drainage and waste disposal**,
- **Protection from falling** (handrail),
- **Conservation of fuel and power** (*2),
- **Accessibility for handicapped people** (*2),
- **Restriction on location in order to prevent disasters**, such as landslide and tsunami. (*3)
- **Minimum floor area per dwelling unit** from the viewpoint of housing policy.

(*1) In Japan, this aspect is categorized into Group B.

(*2) These aspects were introduced relatively recently in the world.

(*3) In many countries, this requirement is implemented in combination with city planning.

Group B: Technical requirements from the viewpoint of city planning

Local authorities in most countries have authorized their city plans consisting of some maps and values, which indicate:

- location of various **land use zones** (residential zone, commercial zone, industrial zone, etc.),
- limit values of **building height**, **FAR** (Floor Area Ratio) and **BCR** (Building Coverage Ratio),
- location of **external wall lines**,
- etc.

Then, in order to make construction activities of buildings follow the city plan, it is required to construct and maintain buildings in compliance with building technical requirements responding to the local conditions shown in the city plan.

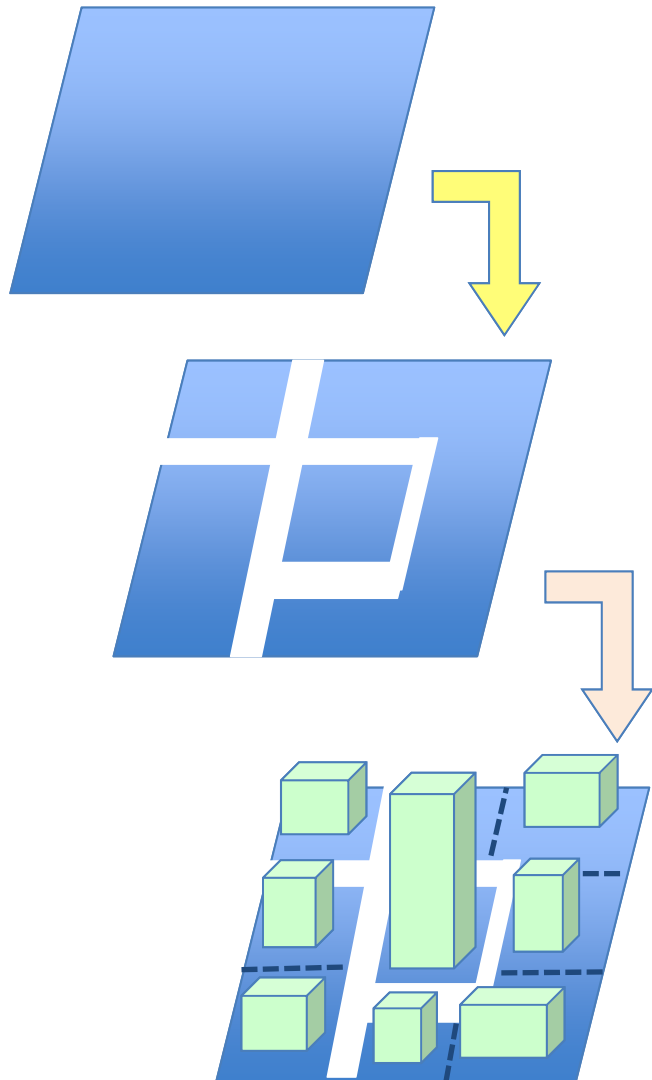
Aspects covered by such technical requirements are as shown below. The technical requirements of such aspects are adopted by many countries.

Aspects of Technical Requirements of **Group B** (example)

- **Building use**,
- **Location of external wall**,
- **Building height**,
- **FAR (Floor Area Ratio)** and **BCR (Building Coverage Ratio)**,
- **Landscape feature** (shape of roof, material and color of external wall, restriction on advertisement board, etc.),
- Obligatory number of **parking lots**.

Group C: Technical requirements from the viewpoint of **land-development**

When someone implements a large scale development, such as housing estate development, the development plan goes through two steps as shown below. And, in many countries, two kinds of permits are required responding to each step.



Step 1: Land-development

A developer:

- (1) makes a land-development plan,
- (2) gets **land-development permit** or the like,
- (3) constructs necessary infrastructure, and then
- (4) sells plots to consumers/companies.

Step 2: Building Construction

Each building owner (consumer/company):

- (1) makes his/her own building plan,
- (2) gets **building permit**, and then
- (3) constructs his/her building.

Two kinds of permits as shown above have different characters from each other.

	Land-development Permission (*1)	Building Permission (*2)
when to apply	Before construction of infrastructure of the development area	Before construction of each building
applicant	Developer	Building owner
criteria	Technical requirements of: - Group C	Technical requirements of: - Group A and Group B

(*1) The actual official procedure depends on the country. For example, it is done through:

- land-development permission in Japan,
- sub-division control system in many states of the USA,
- concession process in China, and
- formulation process of B Plan in Germany.

(*2) 'Building Permission' is very common in the world, while, In Japan, it is required for a building owner to get 'Building Confirmation' instead of 'Building Permission'. 'Building Confirmation' is not so different from 'Building Permission' of the other countries.

Aspects covered by such technical requirements are as shown below. The technical requirements of such aspects are adopted by many countries.

Aspects of Technical Requirements of **Group C** (example)

- **The use of scheduled buildings** shall conform the city plan (*).
- **Roads** shall conform the road construction standard (*) in considering the scheduled buildings, etc.
- **Parks**, open spaces and other vacant spaces for public use shall conform construction standard (*) in considering the scheduled buildings, etc.
- **Sewers and other drainage facilities** shall conform the construction standard (*) in considering the scheduled buildings, etc.
- **Water supply facilities** shall conform the construction standard (*) in considering the scheduled buildings, etc.
- **Schools and other facilities** shall conform the regional-development standard (*) in considering the scheduled buildings, etc. if necessary.

(*) City plan and these standards are prepared by related authorities.

Chapter 2 Basic Legal Document and Technical Documents

Basic Legal Document and Technical Documents for Group A

Building control is an activity to limit people's freedom of construction. Therefore, it is necessary for the Government to issue legislative documents regarding building control system as shown below.

(1) Basic Legal Document and its supplementary documents

At first, it is necessary to establish Basic Legal Document, main points of which are as shown below.

(a) Buildings must be constructed and maintained in compliance with **technical requirements**, which are prepared by authorities. >> (2)

(b) When someone intends to construct a building, he/she must complete the **official procedure, such as building permission.**

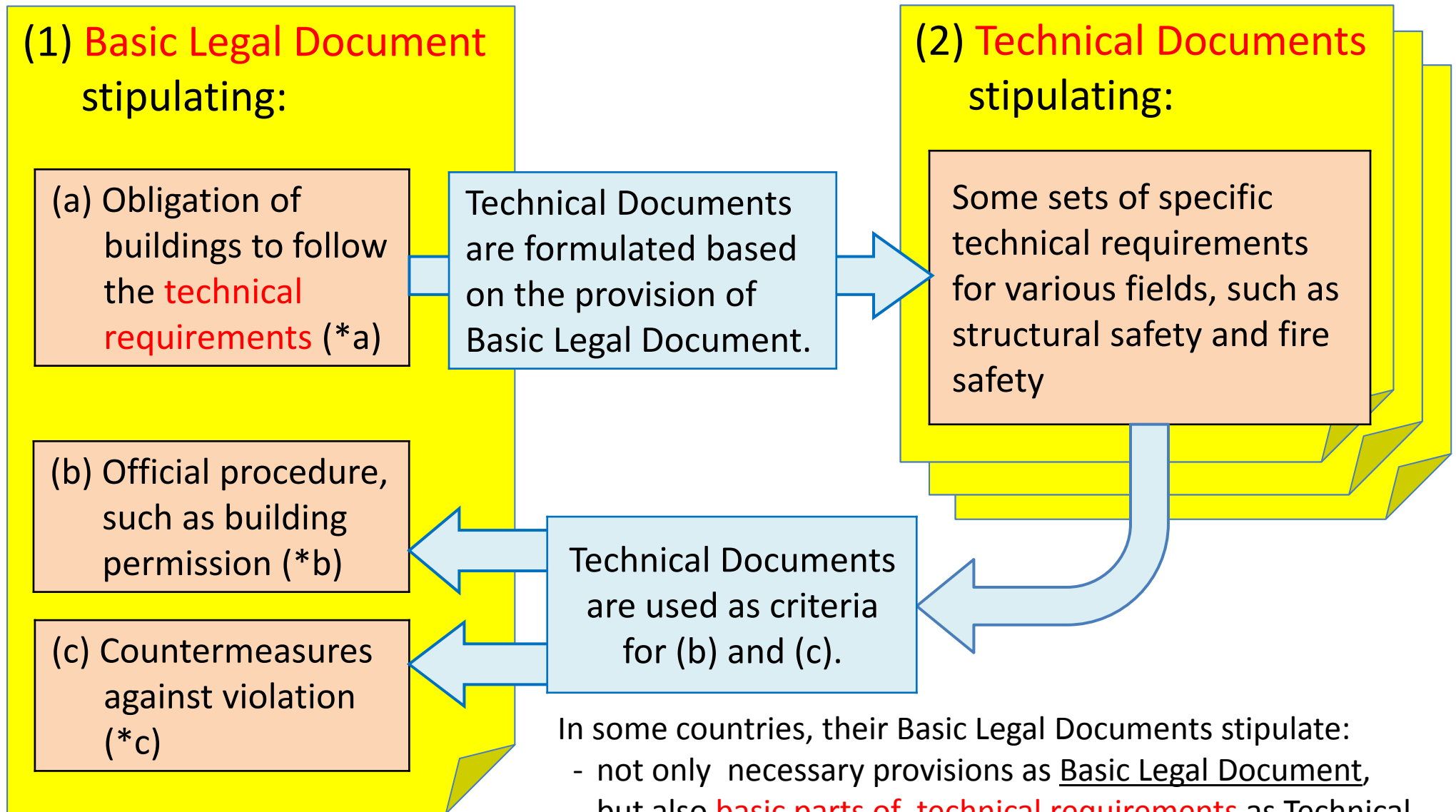
(c) The government has a power to take **countermeasures** against buildings which violates technical requirements.

Relationship between '(1) Basic Legal Document' and '(2) Technical Documents' is as shown in the figure of the next page.

(2) Technical Documents and their supplementary documents

Secondary, it is necessary to authorize some sets of technical requirements, which are mentioned in above (1)(a). They are documents stipulating specific criteria to satisfy technical requirements of Group A.

Relationship between Basic Legal Document and Technical Documents for Group A



In some countries, their Basic Legal Documents stipulate:

- not only necessary provisions as Basic Legal Document,
- but also **basic parts of technical requirements** as Technical Documents.

- (*a) It is also important to stipulate **who has a power to determine or approve the mandatory technical requirements.**
- (*b) As an official procedure to ensure compliance with the technical requirements, building permission and on-site inspection by the government is very common in the world, while some countries, such as Japan, England and Australia, adopt an official procedure done by the non-government parties. In these countries, building owners may choose:
- either **official procedure done by the local government,**
 - or **official procedure done by the non-government parties.**
- (*c) The power of the government for the countermeasures against violation includes rights:
- **to order related parties, such as a building owner,** to:
 - stop the construction work,
 - stop the use of the building,
 - correct the building, or
 - demolish the building, and then,
 - **to execute by itself what the government ordered,** in cases where the government orders are not implemented within the grace period.

Basic Legal Document comparing several countries

Countries can be categorized into two types as shown below.

	Countries of Type 1	Countries of Type 2
		Most countries adopting federal system, such as USA, Australia, Canada and India, fall into this type.
Party who establishes Basic Legal Document	The National Government itself	Major local authority , such as state, province and large city
Applicable area	All over the country	Major local authority which has issued its own Basic Legal Document
Parties who: (1) give building permits for individual construction activities, and (2) take countermeasures against illegal buildings.	Local authorities * In some countries, the National Government itself also gives building permits for large scale buildings, etc.	Major local authority which has issued its own Basic Legal Document

Specific Basic Legal Documents in countries of **Type 1** are as shown below.

<Common characteristics>

Every Basic Legal Document is proclaimed by the National Government itself.

Country	Name of Basic Legal Document	Proclaimer
Japan	Building Standard Law	National Government
England	Building Act	ditto
Thailand	Building Control Act	ditto
Vietnam	Construction Law	ditto
the Philippines	National Building Code	ditto

Specific Basic Legal Documents in countries of **Type 2** are as shown below.

<Common characteristics>

Basic Legal Document depends on the local authority. Therefore, most Federal Governments are working to harmonize various Basic Legal Documents in their country, while Federal Government of USA is not directly involved in the building control issue.

Country	Name of Basic Legal Document	Proclaimer
USA	Building Code	each state and large city
Germany	State Building Regulation	each state
Australia	Building Act	each state and territory
India	Building Bye-law	each state and large city * Delhi is an exception.

Technical Documents comparing several countries

Countries can be categorized into two types as shown below.

	Countries of Type 1	Countries of Type 2
Party who authorizes Technical Documents	The National Government itself	Major local authority , such as state, province and large city
Applicable area	All over the country. * Local authorities may authorize <u>additional requirements</u> in consideration of local circumstances.	Major local authority which has authorized Technical Documents * In order to avoid confusion due to differences in requirements, many countries are working to harmonize various Technical Documents in their countries. Detail will be described later.

In some countries, their Basic Legal Documents stipulate:

- not only necessary provisions as Basic Legal Document,
- but also basic parts of technical requirements as Technical Documents.

For example, Building Standard Law of Japan, National Building Code of the Philippines, and Building Code of each state and large city of USA have a dual role of both Basic Legal Document and Technical Documents.

Specific Technical Documents in countries of **Type 1** are as shown below.

<Common characteristics>

Every Technical Document is authorized by the National Government itself. And then, it applies commonly to all over the country.

Country	Name of main Technical Documents and its characteristics	Authorizer
Japan	<ul style="list-style-type: none"> - Building Standard Law (providing main point of technical requirements) - Enforcement Order (providing detail of technical requirements) 	National Government
England	<ul style="list-style-type: none"> - Building Regulations (providing technical requirements with performance-based descriptions) - Approved Documents (providing practical guidance to satisfy technical requirements described in Building Regulations) 	ditto
Thailand	- Ministerial Regulations	ditto
Vietnam	- Vietnam Building Code	ditto
the Philippines	<ul style="list-style-type: none"> - National Building Code - National Structural Code (*) <p>* National Structural Code has been published by the nationwide non-government organization (ASEP: Association of Structural Engineers of the Philippines), and then, <u>has been positioned as Referral Code</u> to National Building Code.</p>	ditto

Specific Technical Documents in countries of **Type 2** are as shown below.

<Common characteristics>

Technical Documents depends on the local authority. In order to avoid confusion due to differences in technical requirements, many countries are working to harmonize various Technical Documents in their countries. Consequently, technical requirements in the field of structural safety are almost common in each country, while technical requirements in the field of fire safety somewhat vary in regions even in the same country.

Country	Technical Documents	Proclaimer
USA	Building Code <Harmonization> International Building Code and related Code are issued by ICC (International Code Council). They are <u>model codes</u> for reference of states and large cities.	each state and large city
Australia	Building Code <Harmonization> Building Code of Australia is issued by ABCB (Australian Building Codes Board). It is a <u>model code</u> for reference of states and territories.	each state and territory
India	Building Bye-law <Harmonization> (1) Federal Government of India published Model Building Bye-law in 2016, and recommends local authorities to issue each Building Bye-law in referring the Model Building Bye-law. (2) National Building Code of India is issued by the Minister. Its many provisions are quoted in many Building Bye-laws.	each state and large city *Delhi is an exception.

Basic Legal Document and Technical Documents for Group B

Basic Legal Document for Group B (City Planning Act or the like)

At first, it is necessary to establish the document, which gives the government a power to control buildings regarding technical requirements of Group B.

In many countries, **City Planning Act or the like** has been established for this purpose.

Main points of City Planning Act or the like are as follows:

(a) It stipulates:

- **what should be indicated in the City Plan,**
- who determine the City Plan for each region, and
- how to determine the City Plan.

(b) Buildings must be constructed and maintained **in compliance with:**

- **the city plan and**
- **the technical requirements,** which are prepared by authorities.

(c) When someone intends to construct a building, he/she must complete the **official procedure,** such as building permission.

(d) The government has a power to take **countermeasures** against a building which violates city plan or technical requirements.

* Statements regarding (b), (c) and (d) are provided in Basic Legal Document for Group B in some countries including Japan.

City Plan and Technical Requirements

In many countries, based on City Planning Act or the like,

(1) local authorities authorize their **city plans consisting of some maps and values**, which indicate:

- location of various land use zones,
- limit values of building height, FAR (Floor Area Ratio) and BCR (Building Coverage Ratio),
- location of external wall lines,
- etc.

(2) On the other hand, the national government or local authorities issues **Technical Document**, which stipulates necessary provisions defining:

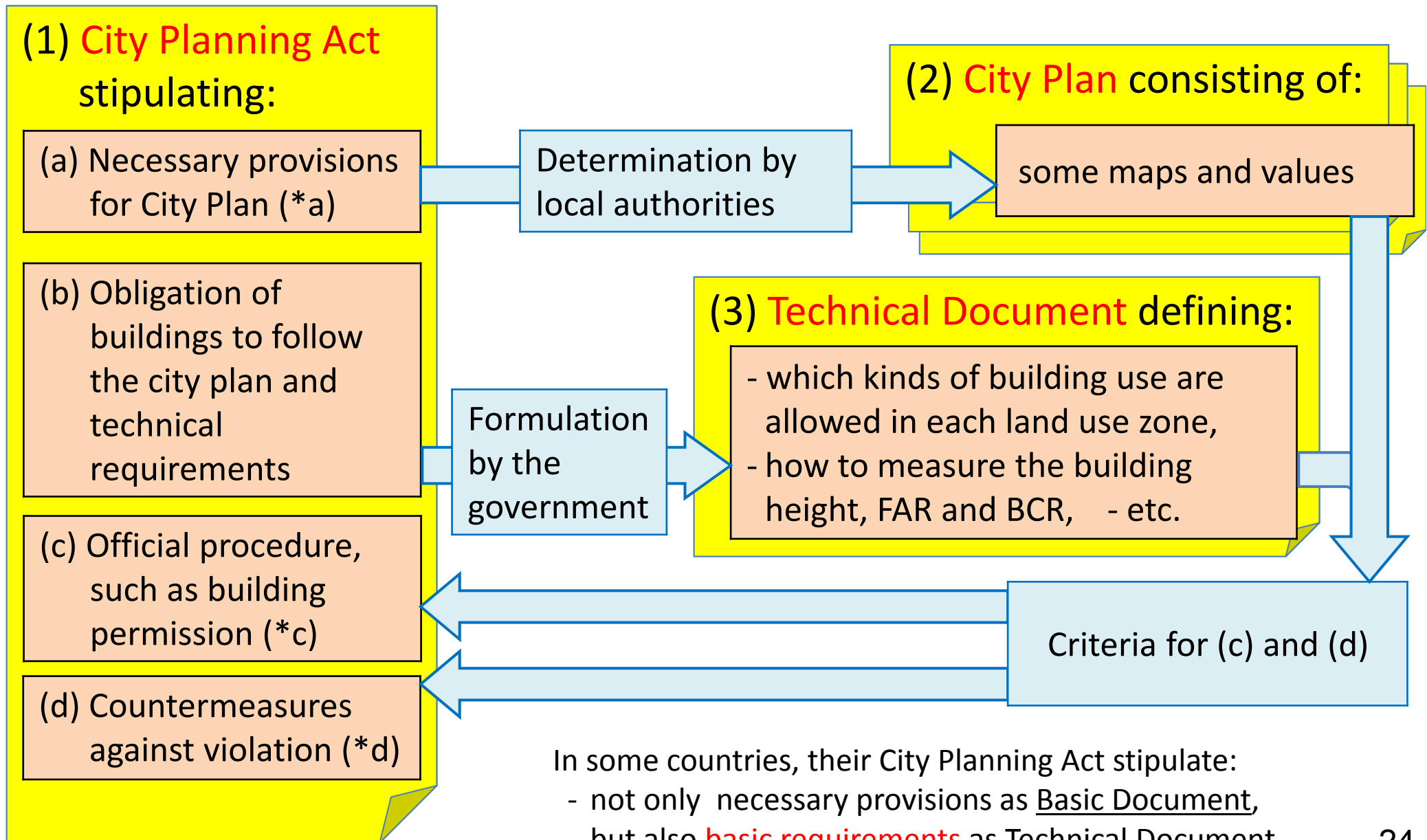
- which kinds of building use are allowed in each land use zone,
- how to measure the building height, FAR and BCR,
- which parts of buildings are allowed to stick out from the external wall lines,
- etc.

And then, buildings are required to follow technical requirements, which are applied to each building responding to its site-location in the city plan.

Relationship among:

- (1) Basic Legal Document for Group B (City Planning Act or the like),
 - (2) City Plan, and
 - (3) Technical Document
- is as shown in the figure of the next page.

Relationship among (1) Basic Legal Document (City Planning Act or the like), (2) City Plan, and (3) Technical Document



- (*a) City Plans are determined by local authorities in most countries.
- (*c) As an official procedure to ensure compliance with city plan and the technical requirements, building permission by the government is very common in the world.
- (*d) The power of the government for the countermeasures against violation includes rights:
- to order related parties, such as a building owner, to:
 - stop the construction work,
 - stop the use of the building,
 - correct the building, or
 - demolish the building, and then,
 - to execute by itself what the government ordered, in cases where government orders are not implemented within the grace period.

Chapter 3 Performance-based Solutions

Specification-like provisions

In many countries, in their early stages of building control history, they provided building requirements with sets of specification-like provisions. Such specification-like provisions were formulated in assuming normal buildings which were constructed with commonly-used construction method and usual features of design.

For example,

“In case of the hospital which has three or more stories, it must be constructed with fire resistive construction and all parts of the floor to be used as hospital must be within 40 m of the nearest staircase.”

is one of the specification-like provisions of Japanese building requirements.

Performance-based provisions

Specification-like provisions became difficult when it came to the buildings with innovative solutions, such as:

- buildings with brand-new building materials,
- buildings using brand-new construction methods, and
- buildings with unusual features of design.

Therefore, from around the year 2000, many progressed countries adopted performance-based code system in their building requirements.

For example,

“When a fire has started in any room of the building, during the time period until all occupants have completed evacuation from the building to the ground, smoke or gas must not descend to a level that is detrimental for evacuation.”

is provided as one of the performance-based provisions of Japanese building requirements. When an applicant selects application of this provision, the authorities may judge whether the building plan complies with evacuation requirements of the Japanese building code or not with this provision instead of the specification-like provisions.

‘Performance-based Solution System’ using ‘Performance-based provisions’ depends on countries, as shown in the pages below.

Performance-based Solution System in England

A set of 'Requirements' contained in 'Schedule 1' of 'Building Regulation 2010', which was issued by the Minister

All buildings are required to comply with these 'Requirements', which are described with performance-based manner. It is, however, not easy to judge whether each building solution complies with 'Requirements' or not, because they are described in performance-based manner. Therefore, 'Approved Documents' are prepared as shown in the right.



'Approved Documents' which were approved by the Minister

Most buildings are designed following 'Approved Documents', which are described with specification-like manner. If a building complies with 'Approved Documents', the building is deemed to satisfy 'Requirements'.

Alternative ways

Every applicant may select 'alternative ways' instead of solutions stated in 'Approved Documents'. In this case, the authority judges whether the building plan complies with building code or not, directly using 'Requirements' instead of descriptions in 'Approved Document'.

Performance-based Solution System in **Australia**

'Performance Requirements', which is provided in BCA (Building Code of Australia)

All buildings are required to comply with these **'Performance Requirements'**, which are described with performance-based manner. It is, however, not easy to judge whether each building solution complies with 'Performance Requirements' or not, because they are described in performance-based manner. Therefore, **'Deemed-to-Satisfy Provisions'** are prepared as shown in the right.



'Deemed-to-Satisfy Provisions', which are provided in BCA.

Most buildings are designed following **'Deemed-to-Satisfy Provisions'**, which are described with specification-like manner. If a building complies with **'Deemed-to-Satisfy Provisions'**, the building is deemed to satisfy **'Performance Requirements'**.

Alternative Solutions

Every applicant may select **'alternative solutions'** instead of solutions depending on **'Deemed-to-Satisfy Provisions'**. In this case, the authority judges whether the building plan complies with building code or not, directly using **'Performance Requirements'** instead of **'Deemed-to-Satisfy Provisions'**. There are some **'Verification Methods'** as assessment methods responding to some **'Performance Requirements'**.

Performance-based Solution System in USA

'Building Requirements', which are provided in each Building Code, which is issued by each state or municipalities.

Most buildings are designed following **'Building Requirements'**, which are described with **specification-like manner**. There are, however, some innovative buildings. Therefore, **'Deemed-to-Satisfy Provisions'** are prepared as shown below.



Special Procedure for Alternatives

Most states and municipalities establish special procedure to approve alternatives in their building codes as shown below.

'Provision for Alternatives', which is provided in most Building Codes.

For example, Model Code of IBC (International Building Code) has a provision as shown below.

"An alternative material, design or method of construction shall be approved where the building officials 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."

Performance-based Solution System in Japan

This item is introduced in Chapter 9 of Part C.