History of Building Regulation in Japan

(1) Before modern legislation
Regional governors regulated buildings for purposes, such as prevention of conflagrations in urban areas.

(2) In 1920
The Japanese Government enforced the Urban Building Law.
(a) Covered area: Six largest cities at that time
(b) Building permission: Building permission by the police of each prefecture for construction of certain buildings.

(3) In 1950
The Japanese Government enforced the Building Standard Law.
(a) Covered area: Everywhere in Japan (Zoning codes only apply city-planning area.)
(b) Building permission: Building confirmation by local governments (building officials) for construction of every building.
Building Regulatory Procedures

- **Design (Kenchikushi)**
  - Preparation of Building Plans
- **Building Construction (Contractor)**
  - Start of Building Construction
  - Building Construction
- **Superintendence (Kenchikushi)**
  - Completion
  - Interim Inspection
  - Final Inspection
- **Periodic Inspection (Kenchikushi or qualified inspector)**
  - Start of Occupancy
  - Owner’s periodic reporting
  - Designated Administrative Agencies (local government)
  - Building official (local government) or Designated Confirmation and Inspection Body
    - Review Report
    - Review
    - Certification

- **Designated Structural Calculation Review Body**
  - Review Report
  - Certification
  - Review
Kenchikushi (Architect and Building Engineer)

Only a Kenchikushi shall engage in the design or the superintendence of related construction work (Kenchikushi Law Article3～Article3-3)

Licensed by

Minister of MLIT
359,605※

Prefectural Governors
751,763※

Prefectural Governors
17,523※

※ Number as of 31st March 2015
(1) Sophistication of seismic codes

(a) In 1923, Great Kanto Earthquake hit Tokyo and surrounding regions, and caused:
- 254,000 buildings collapsed or severely damaged;
- 447,000 buildings destroyed by fire, which were simultaneously broke out in many places; and
- More than 105,000 persons dead or missing.

(b) In 1924, the Japanese seismic codes were revised to require structural calculation in considering seismic force. This was the first such requirement in the world.

(c) Learning the damages of earthquakes, such as Niigata earthquake in 1964, Tokachi Off-shore earthquake in 1968, and Miyagi Off-shore earthquake in 1978, and developing the seismic technology, structural calculation methods as well as specific structural provisions stated in the seismic codes have been sophisticated.

(d) Current seismic codes are based on the codes enforced in 1981. (Sophistication has been continued.)
Trends in development of earthquake-resistance measures

- **1923**: Niigata eq.
- **1924**: Great Kanto eq.
- **1950**: Enactment of the Building Standard Law (BSL)
- **1971**: Amendment of the BSL
  - Strengthening of RC standards
- **1981**: Amendment of the BSL
  - (New Seismic Codes)
  - Not damaged by medium-scale earthquakes
  - Not collapsed by large-scale earthquakes
- **1995**: Enactment of the Act on Promotion of Seismic Retrofitting of Buildings (APSRB)
  - Approval of seismic retrofitting plans
- **2004**: Amendment of the APSRB
  - Mandatory seismic assessment of large-scale hospitals, department stores, hotels and schools, etc.
- **2005**: West Off Fukuoka eq.
- **2006**: Off Niigata-Chuetsu eq.
- **2007**: Noto Peninsula eq.
- **2008**: Iwate-Miyagi Inland eq.
- **2009**: Iwate North Coast eq.
- **2011**: Great East Japan eq.
- **2013**: Many buildings built before 1981 do not comply with the current seismic standard.

《Major earthquakes》

- Great Kanto eq.
- Niigata eq.
- Tokachi Off-shore eq.
- Miyagi Off-shore eq.
- Great Hanshin-Awaji eq.
- Niigata-Chuetsu eq.
- West Off Fukuoka eq.
- Off Niigata-Chuetsu eq.
- Noto Peninsula eq.
- Iwate-Miyagi Inland eq.
- Iwate North Coast eq.
- Great East Japan eq.
Background of Seismic Retrofitting

(1) Basic Seismic Code in Japan (1981)
Current seismic regulations in Japan are based on the seismic code enforced in 1981. (They have been sophisticated even after 1981.) Revised code is not applied to the existing buildings unless extension work, etc. is done for them. Therefore, some old buildings remain unsafe.

(2) Great Hanshin-Awaji Earthquake (1995)
It hit Kobe city and surrounding regions and 104,906 buildings collapsed, and 6,148 buildings were severely damaged, causing 6,433 deaths. It is estimated that 90% of the deaths were due to falling buildings or furniture.

Most of the collapsed buildings were those which were constructed before 1981. Therefore, seismic retrofitting became an urgent issue in Japan. Then, the Law for Promotion of Seismic Retrofitting of Buildings was established and enforced in the same year (1995).
Damage to buildings from the viewpoint of the construction year - the Great Hanshin-Awaji Earthquake (1995) -

→ Around 90% of victims were killed due to falling buildings or furniture.

→ Damage to buildings was mostly concentrated in buildings that were constructed in and before 1981 and did not meet the seismic code 1981.

Source: Interim report of the Construction Damage Investigation Committee Relating to the 1995 Great Hanshin-Awaji Earthquake
The Act for Promotion of Seismic Retrofitting of Buildings

(1) Background

(a) Earthquake-resistant buildings

(“Earthquake-resistant” represents “meeting to seismic code of 1981”.)

It is needed to promote seismic retrofitting in order to achieve the target of the proportion of earthquake-resistant buildings.

<table>
<thead>
<tr>
<th>Year</th>
<th>Proportion</th>
<th>Designated buildings, such as schools, hospitals, and department stores</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>75%</td>
<td>75%</td>
</tr>
<tr>
<td>2008</td>
<td>79%</td>
<td>80%</td>
</tr>
<tr>
<td>2015</td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td>2020</td>
<td>95%</td>
<td>95%</td>
</tr>
</tbody>
</table>
(2) Points of Recent Amendment of the Act for Promotion of Seismic Retrofitting of Buildings

(a) To place seismic assessment under an obligation, and
(b) To make public the assessment results

<table>
<thead>
<tr>
<th>Objective buildings of seismic assessment</th>
<th>Deadline of seismic assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Large buildings used by many unspecified people, such as <strong>hospitals, department stores</strong>, and <strong>hotels</strong></td>
<td>Until the end of 2015</td>
</tr>
<tr>
<td>(B) Large buildings used by underprivileged people for evacuation, such as <strong>elementary schools</strong>, <strong>junior-high schools</strong>, and <strong>home for the aged</strong></td>
<td></td>
</tr>
<tr>
<td>(C) <strong>Tall buildings along the designated emergency roads</strong></td>
<td>Until the date determined by the local government</td>
</tr>
<tr>
<td>(D) Buildings used for a <strong>disaster prevention center</strong></td>
<td></td>
</tr>
</tbody>
</table>

The Act was revised on May 29, 2013 and was enforced on Nov. 25, 2013.
Subsidy to Promote Seismic Assessment and Seismic Retrofitting

Subsidy ratio for the objective buildings of seismic assessment will be increased as shown in the table below, while subsidy for the other buildings is also available.

<table>
<thead>
<tr>
<th>Objective buildings of seismic assessment</th>
<th>Subsidy for seismic assessment</th>
<th>Subsidy for seismic retrofitting</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Large buildings used by many unspecified people, such as hospitals, department stores, and hotels</td>
<td>10/10 &lt;1/3&gt;</td>
<td>2/3 &lt;11.5%&gt;</td>
</tr>
<tr>
<td>(B) Large buildings used by underprivileged people for evacuation, such as elementary schools, junior-high schools, and home for the aged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(C) Tall buildings along the designated emergency roads</td>
<td>4/5</td>
<td></td>
</tr>
<tr>
<td>(D) Buildings used for a disaster prevention center</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<Remark>

1. **Ratio in the table** indicates subsidy ratio in case where National Government and the local government jointly give subsidy. They pay half each.

2. **Ratio in the angle bracket** indicates subsidy ratio in case where National Government only gives subsidy, and the local government does not give subsidy.
The Project on Building Administration and Enforcement Capacity Development for Seismic Resilience
First Year Yogjakarta (20080201-0331)
Second year West Sumatra, Bengkulu (20080401-20090331)
Third & Forth year North Sulawesi, Golontaro, Central Sulawesi (20090401-20110330)
(Additional)Third & Forth Year, Padang Pariaman (20091104-20100731)
First Year Yogjakarta (20080201-0331)
To improve existing Building Permit system for non-engineered houses

1. To arrange the regulations from the view points below.
   1) Submitting documents for non-engineered houses.
   2) How to check those submitted documents in terms of technical matters.
2. To support the people who submit Building Permit application document by means of Prototype drawing.
3. To enhance the building administration system by means of installing information system.
Key Requirement for Non-engineered Houses Safety
STRUCTURAL ANALYSIS OF CONFINED MASONRY WALL HOUSE
To confirm seismic safety of the house based on Key Requirement
Thank you