Outline of Building Regulations in Japan, 2007

Principal Laws concerning Building Construction

- **Building Standard Law (BSL)**
  - To safeguard the life, health, and property of people, by providing codes concerning site, structure, equipment, and use of buildings

- **City Planning Law**
  - To support efficient urban activities, achieve a pleasant urban environment, and create townscapes by establishing urban land use planning system and infrastructure development system

- **Fire Service Law**
  - To protect people, people’s life, and property from fire and minimize damage caused by fire and other disasters, by providing codes concerning extinguishment facilities, alarm facilities etc.
Composition of the BSL

### Whole area of Japan
- **General Provisions**
  - Administrative Provisions
  - Miscellaneous
  - Penalty
- **Building Codes** (enforced throughout Japan)
  - Structural Section
  - Fire Section
  - Building Equipment Section

### City Planning Areas*
- **Planning Codes** (enforced within “City Planning Areas”)
  - Relation between Sited and Roads
  - Land-Use Zoning Regulation
  - Building Height-Bulk-Shape Control
  - Restrictions in Fire Protection District

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1. **General Provision of the BSL**

- Building Confirmation and Inspection
- *Kenchiku-shi* (Qualified Architect)
Regulatory Process for Building Construction

- Design (Architect)
- Preparation of Building Plans
- Application
- Building Confirmation
- Start of Building Construction
- Application
- Certification
- Interim Inspection
- Building Construction
- Application
- Certification
- Completion
- Application
- Certification
- Final Inspection
- Building Use by Occupants

Special Administrative Agency
- Area, Term, Structure, Use, Scale

Building Owner
- Apply for Inspection

Building Officials, etc.
- Inspection

Building Officials, etc.
- Certification

A building owner shall apply for inspection no later than 4 days after completion of designated process.

Construction work after designated process shall not be restarted until the certification is issued.
Building Regulatory Authorities

Building regulatory authority has been opened to private sector.

<table>
<thead>
<tr>
<th></th>
<th>Special Administrative Agency (public sector)</th>
<th>Designated Confirmation and Inspection Body (private sector)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number (April 2006)</strong></td>
<td>417 (approx. 1800 building officials)</td>
<td>125</td>
</tr>
<tr>
<td><strong>Number of Building Confirmations (2004fy)</strong></td>
<td>333,665</td>
<td>418,871</td>
</tr>
</tbody>
</table>

Kenchiku-shi (Qualified Architect)

- **1st class Kenchiku-shi** can design buildings and superintend construction work covering all buildings.
- **2nd class Kenchiku-shi** can design and superintend construction work mainly for small buildings.
- **Mokuzo (wooden structure) Kenchiku-shi** can design and superintend construction work of only small wooden buildings.
Number of *Kenchiku-shi*

<table>
<thead>
<tr>
<th>1st class Kenchikushi</th>
<th>2nd class Kenchikushi</th>
<th>Mokuze Kenchikushi</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>316,840</td>
<td>681,855</td>
<td>14,322</td>
<td>1,013,017</td>
</tr>
</tbody>
</table>

(as of March 2005)

2. **Building Codes of the BSL**

1) Structural Requirements
2) Fire Safety Requirements
3) Equipment and Sanitary Requirements
Composition of Performance-based Building Codes

Law or Enforcement Order
- Performance Requirement
  - e.g. Fireproof requirement; a fireproof building must not collapse or spread fire until the end of normal fire.
- Performance Criteria
  - e.g. Fireproof criteria; each principal building part such as posts and beams must be able to withstand fire and heat for a designated period.

Enforcement Order
- Advanced Verification Method
- Ordinary Verification Method
- Deemed-to-satisfy Solutions

Enforcement Order or Notifications

Flow of Performance-based Building Confirmation under the BSL

Performance Criteria

Advanced Verification Method
- Evaluation by Evaluation Bodies
- Approval by the Minister

Ordinary Verification Method
- Type-approval by the Minister
- Certification of Specific-type Component Manufacturers

Deemed-to-satisfy solution
- Optional

Building Confirmation
Two Types of Evaluation Bodies

- Same roles
- Two points of difference

<table>
<thead>
<tr>
<th>Nationality /Location</th>
<th>Designated Evaluation Bodies</th>
<th>Recognized Evaluation Bodies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications which can be accepted</td>
<td>Japanese bodies only</td>
<td>Overseas bodies only</td>
</tr>
<tr>
<td>Applications from both Japanese and overseas manufacturers</td>
<td>Applications from overseas manufacturers only</td>
<td></td>
</tr>
</tbody>
</table>
History of Amendment

- **1971 Amendment**
  - After the Offshore Tokachi Earthquake (1968)
  - Reducing the stirrups spaces for improving ductility of RC columns

- **1981 Amendment -“Shin-taishin” Design Method-**
  - After the offshore Miyagi Earthquake (1978)
  - Introducing the current design principle/methods

- **1998 Amendment**
  - After the Great Hanshin-Awaji Earthquake (1995)
  - Expanding pre-verified methods/technologies (with the introduction of interim inspection scheme)

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Composition of Structural Codes

<table>
<thead>
<tr>
<th>Objective</th>
<th>Scale of Building</th>
<th>Composition of Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe against External Forces</td>
<td>Small Building</td>
<td>Deemed-to-satisfy Solutions (all) + Structural Calculation (*2 or *3)</td>
</tr>
<tr>
<td></td>
<td>Medium-sized Building</td>
<td>Deemed-to-satisfy Solutions (all) + Structural Calculation (*2 or *3)</td>
</tr>
<tr>
<td></td>
<td>High-rise Building</td>
<td>Structural Calculation (*3)</td>
</tr>
</tbody>
</table>

*1) Allowable unit stress calculation  *2) Critical strength calculation  *3) Approved by the Minister
Load and External Force

- **Dead load**: Load of each element of a building
- **Live load**: Differs depending on the use of a building
- **Snow load**: Snow depth should be measured by a Designated Administrative Agency
- **Wind pressure**: Wind velocity pressure calculated in accordance with regional conditions
- **Seismic force**: Obtained by calculating the inertial force generated through movement of both ground and the building (allowable unit stress calculation)

Structural Calculation Method

- **Allowable Unit Stress Calculation**
  - To confirm that the stress generated in each of the elements does not exceed the allowable unit stress of the material.
- **Critical Strength Calculation**
  - To calculate directly the stress and deformation of a building.
- **Seismic Design Method based on Energy Method**
  - To compare the seismic energy and the energy the buildings can dissipate.
- **Advanced Methods Approved by the Minister**
  - An overall vibration model shall be prepared accounting for resistance of each part of the building with the passage of time.