Thing on going and done in Japan

Shiro Nakajima  Building Research Institute
- The so-called building waste recycle law was enforced in 2000. After that there is no drastic movement in Japan for the C&D waste.

- The government is reporting the state of art of C&D waste every 5 years. We are expecting a new statistic data in 2010.
National report for the C&D waste

Amount of the C&D waste

<table>
<thead>
<tr>
<th>Year</th>
<th>Waste from engineering works of public sector</th>
<th>Waste from engineering works of private sector</th>
<th>Construction waste from building industry</th>
<th>Demolition waste from building industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>59%</td>
<td>4%</td>
<td>16%</td>
<td>22%</td>
</tr>
<tr>
<td>2000</td>
<td>62%</td>
<td>4%</td>
<td>14%</td>
<td>21%</td>
</tr>
<tr>
<td>2005</td>
<td>57%</td>
<td>5%</td>
<td>18%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Weight (Million tons)
Recycle ratio of the C&D waste

- Waste from engineering works being recycled:
  - 1995: 58%
  - 2000: 85%
  - 2005: 92%

- Waste from building industry being recycled:
  - 1995: 42%
  - 2000: 85%
  - 2005: 8%

- Waste from engineering works being landfilled:
  - 1995: 15%
  - 2000: 15%
  - 2005: 8%

Year:
- 1995
- 2000
- 2005

Weight (Million tons):
- 0
- 10
- 20
- 30
- 40
- 50
- 60
- 70
- 80
- 90
- 100
National report for the C&D waste

Types of the C&D waste

<table>
<thead>
<tr>
<th>Year</th>
<th>Weight (Million tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>36% Asphalt waste 37% Concrete waste 10% Soil waste 10% Mixed waste 6% Wood waste 4% Other waste</td>
</tr>
<tr>
<td>2000</td>
<td>35% Asphalt waste 41% Concrete waste 10% Soil waste 6% Mixed waste 6% Wood waste 4% Other waste</td>
</tr>
<tr>
<td>2005</td>
<td>34% Asphalt waste 41% Concrete waste 10% Soil waste 4% Mixed waste 6% Wood waste 6% Other waste</td>
</tr>
</tbody>
</table>

Weight (Million tons)
National report for the C&D waste

Amount of the land filled waste

<table>
<thead>
<tr>
<th>Year</th>
<th>Weight (Million tons)</th>
</tr>
</thead>
</table>
We are expecting a new report in the year 2010.
Outline

- The so called building waste recycle law was enforced in 2000. After that there is no drastic movement in Japan for the C&D waste.

- The government is reporting the state of art of C&D every 5 years. We are expecting a statistic data in 2010.

- CASBEE (Comprehensive Assessment System for Building Environment Efficiency) the labeling system has been revised in 2008.
CASBEE (Comprehensive Assessment System for Building Environment Efficiency) is an environmental labeling method for building, based on assessment of the performance of buildings.
Assessment methods for resources and materials management

Water Resource

1.1 Water Saving
1.2 Utilization of Rainwater & Grey Water

Material of Low Environmental Load

2.1 Reduction of Material Consumption
2.2 Reuse of Existing Buildings’ Skelton etc
2.3 Utilization of Recycled Structural Materials
2.4 Utilization of Recycled Non-Structural Materials
2.5 Utilization Timber from Sustainable Forestry
2.6 Reusability of Components & Materials

The red part has been revised.
Assessment methods for resources and materials management

Utilization Materials with Low Health Risks

3.1 Utilization Materials with Low Health Risks
3.2 Prevention of use of CFCs & Halons
- The so-called building waste recycle law was enforced in 2000. After that there is no drastic movement in Japan for the C&D waste.

- The government is reporting the state of art of C&D every 5 years. We are expecting a statistic data in 2010.

- CASBEE (Comprehensive Assessment System for Building Environment Efficiency) the labeling system has been revised in 2008.

- The so-called 200 years service life housing project started in 2008. (BRI involved in)
National project to promote “High Quality Long Service Life Houses” started from 2008.

Outline

The amount of budget is approximately 15 billion Japanese YEN (110 million Euro) annually.

The project is a 5 years program.
200 years service life housing project

Programs

1. Supports research and development.

2. Create systems to financially support the home owners who will construct high quality long service life houses.

3. Provides standards that high quality long service life houses should meet.

4. Create approval system for the high quality long service life houses.
1. In the system to financially support the home owners the financial support will be given to who will construct high quality long service life houses or renovate existing houses to high quality long service life houses.

2. The houses have to achieve a certain quality.

3. The government have already run the system for three times and 163 proposals have been accepted.
Financially Supporting System

The house should satisfy a certain level for the following requirements.

1. Durability
2. Structural safety against earthquakes
3. Energy efficiency
4. Barrier free design
5. Maintenance friendly design
6. Renovation friendly design
7. History recording system
8. Neighbor considering design
9. Minimum floor area
- Life cycle carbon minus housing project started in 2009. *(BRI involved in)*
National project to design and build Life Cycle Carbon Minus Houses started from 2009.

The project is to design and construct houses whose carbon balance will totally be minus.
- Life cycle carbon minus housing project started in 2009. \textit{(BRI involved in)}

- Japan society of Steel Construction (JSSC) and Japan Iron and Steel Federation (JISF) have launch on a national research and development project on innovative steel structure. \textit{(BRI partially involved in)}
Innovative Steel Project

Outline of the project

- Develop steel material two times stronger than the currently used steels.
- Develop technologies to construct steel structures using the new type of steel material.

Objective of the project

- 1. Develop technologies to construct structure with high seismic performance.
- Reduce the materials input.
- Reuse the structural members.
- Steels having two times stronger strength than the steels normally used have been developed.
Innovative Steel Project (Continued)

- **CO₂ Emission (kg-CO₂/yr/m²)**
  - Current System: [Graph]
  - New System: [Graph]
  - Difference: -31%

- **Waste (kg/yr/m²)**
  - Current System: [Graph]
  - New System: [Graph]
  - Difference: -84%
The prototype structure was built in BRI.

Most of the joints are dry joints by limiting the usage of welding.
IC-tags were put on all structural members and their production histories and histories as structural members were recorded.
Innovative Steel Project (Continued)

- Information can be received by getting the IDs from the IC-tags and accessing the database.
Innovative Steel Project (Continued)

- The structure was deconstructed.
Innovative Steel Project (Continued)

- Intended to rebuilt.