Promotion to Residents regarding Seismic Resistant Measures

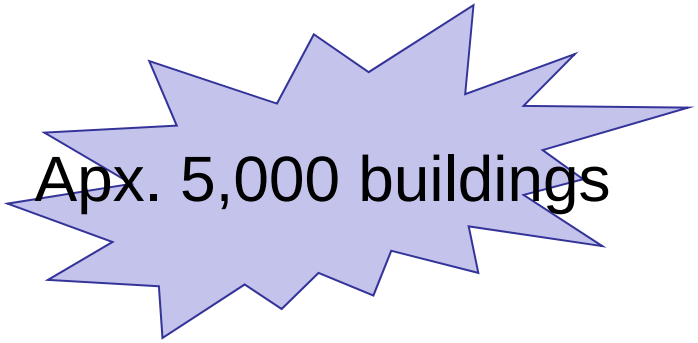
Building Planning Section
Urban Building Division
Urban Development Bureau

Publicity to the Owners of Buildings along the Emergency Transportation Roads

Promotion to Building Owners and Publicity of Regulation

- Insertion on newspaper
- Implementation of briefing meetings and individual visits together with city/ward government and TMG to building owners

Specific Buildings along Specific Emergency Transportation Road



Characteristics:

- Owned by Company: 55%
- Condominiums: 12%

- Apx.93% of the owners recognize the necessity of seismic retrofit

- Building age more than 40 years: 28% (Building age more than 35 years: 62%)

Source: Questionnaire to the Owners of the Specific Building along Specific Emergency Transportation Road (2009)

Insertion on Newspaper

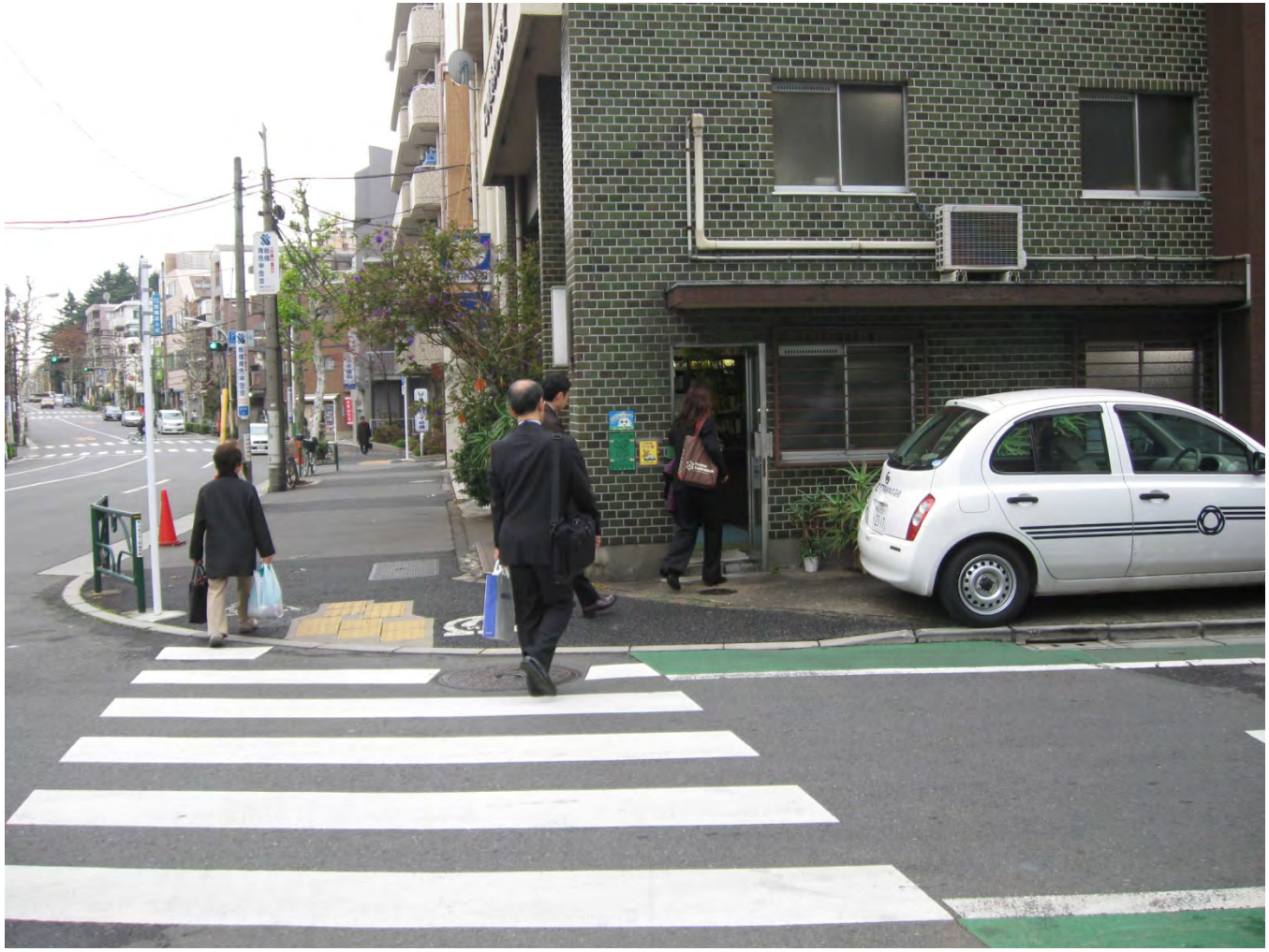
[Make Seismic Diagnosis of Specific Buildings along Specific Emergency Transportation Road Obligatory]

“Volition of Tokyo”

(Major 6 Newspapers)

Implementation of Briefing Meetings

Implementation of Individual Visits



Outline of Briefing Meetings and Individual Visits

	Number of Target Buildings	Total Length (km)	Briefing Meetings		Individual Visits (buildings)
2009	Apx.1,000	100	21 times	136 buildings (160 persons)	923
2010	Apx. 3,000	450	38 times	154 buildings (160 persons)	3,066
2011	Apx. 5,000	2,000	88 times	875 buildings (1,251 persons)	1,578

Earthquake Resistance Standards of Buildings

(Focusing on Building Standards Law)

Earthquake Resistance Standards are Specified by the Building Standards Law

Various standards are specified in the Building Standard Law, including earthquake resistance standards of buildings

1 Standards in urban areas

(1) Relationship between building site and road

(2) Purpose zoning

(3) Building-to-land ratio

(4) Floor area ratio

(5) Building height

2 Standards for buildings

(1) Fire prevention/evacuation

(2) Safety in daily life

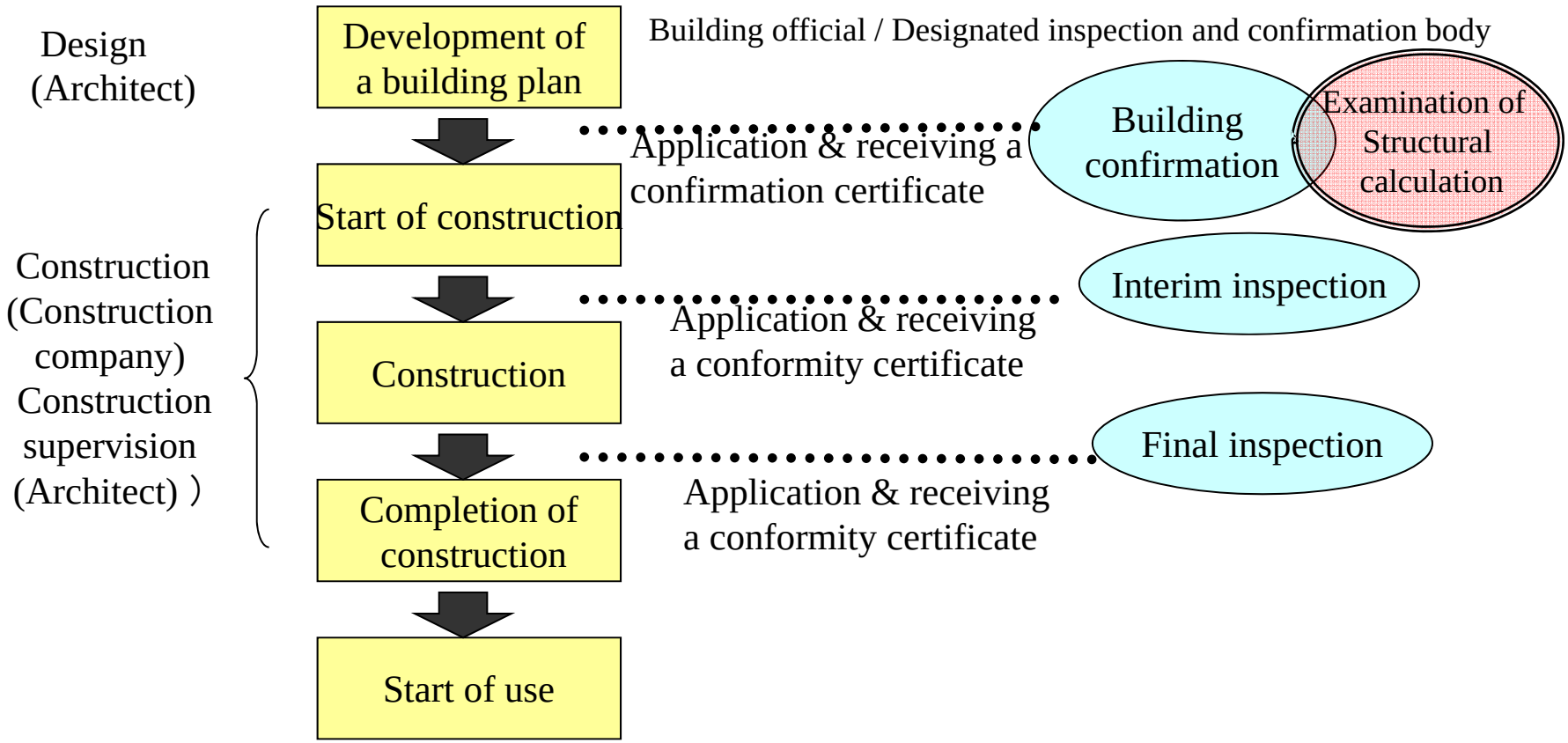
(3) Living environment/Sanitation

(4) Structure (Earthquake resistance standards)

(5) Building equipment

Procedures in the Building Standards Law

Procedures from the development of a building plan to the start of use are specified in the law and the involvement of the administration ensures the safety.



Basic Concept of Earthquake Resistance Standards - 1

The basic concept is that the building structure must be safe against not only earthquakes but also the dead load, live load, snow load, and wind pressure.

Dead load:	Weight of concrete, reinforcing bars, etc.
Live load:	Weight of people, furniture, vehicles, etc.
Snow load:	Weight of snow
Wind pressure:	Swaying caused by wind
Earthquake:	Shaking caused by an earthquake

Basic Concept of Earthquake Resistance Standards - 2

Deal with it based on the risk management concept and considering economic efficiency, rather than to build perfect buildings to resist any possible earthquake

(1) Regular dead load and live load shall be safely supported.
(2) No damage shall be caused by a medium earthquake that rarely occurs (once in 20 years).
(3) No fall or collapse shall be caused by a large earthquake that very rarely occurs (once in 100 years)

Revision of the Law, with Earthquake as a Trigger

In Japan, a country of earthquakes, large scale earthquake disasters have trigged the strengthening of earthquake resistance standards. The base of the current standards were introduced in 1980.

Earthquake	Revision of the Law
The Tokachi-Oki Earthquake (1968) Many cases of damage to RC buildings M 7.9, 49 deaths, 673 buildings collapsed	Introduction of new earthquake resistance standards (1980) ・New provisions of two-step structural calculation ・Increase of the shear wall area for wooden buildings
The Miyagi-Oki Earthquake (1978) Damage to the buildings with pilotis or large eccentricity M 7.4, 27 deaths, 651 buildings collapsed	
The Great Hanshin-Awaji Earthquake (1995) Damage or collapse of the buildings with old earthquake resistance standards or poorly constructed M 7.2, 6,432 deaths, 104,906 buildings collapsed	Introduction of interim inspection (1998) (reference) Introduction of the Law for Promotion of Seismic Retrofitting of Buildings (1995)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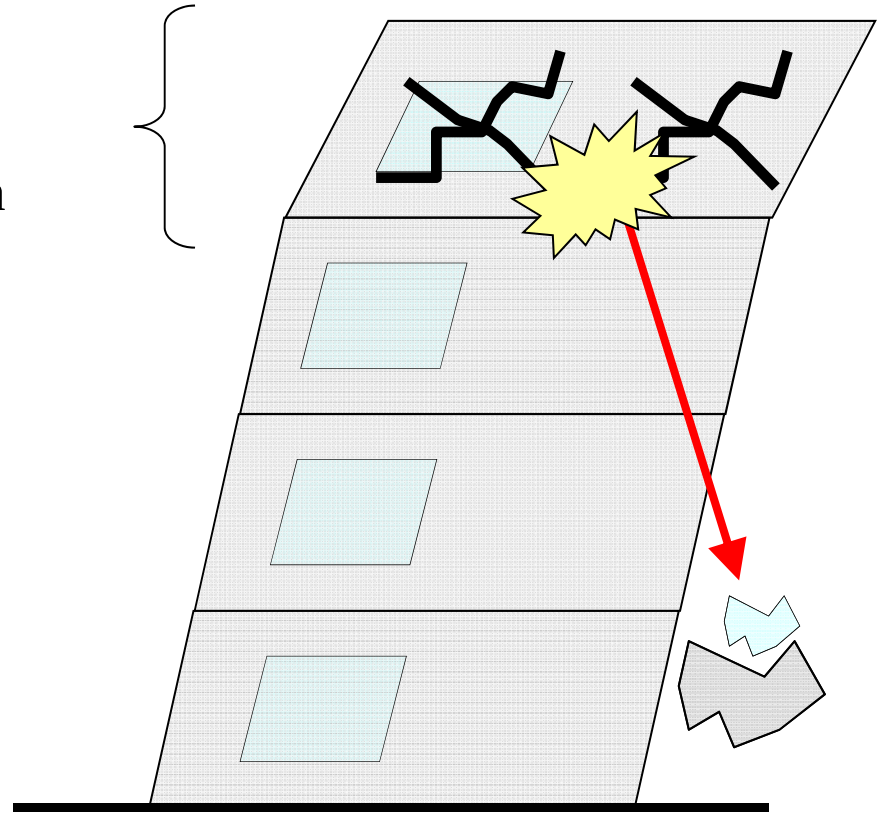
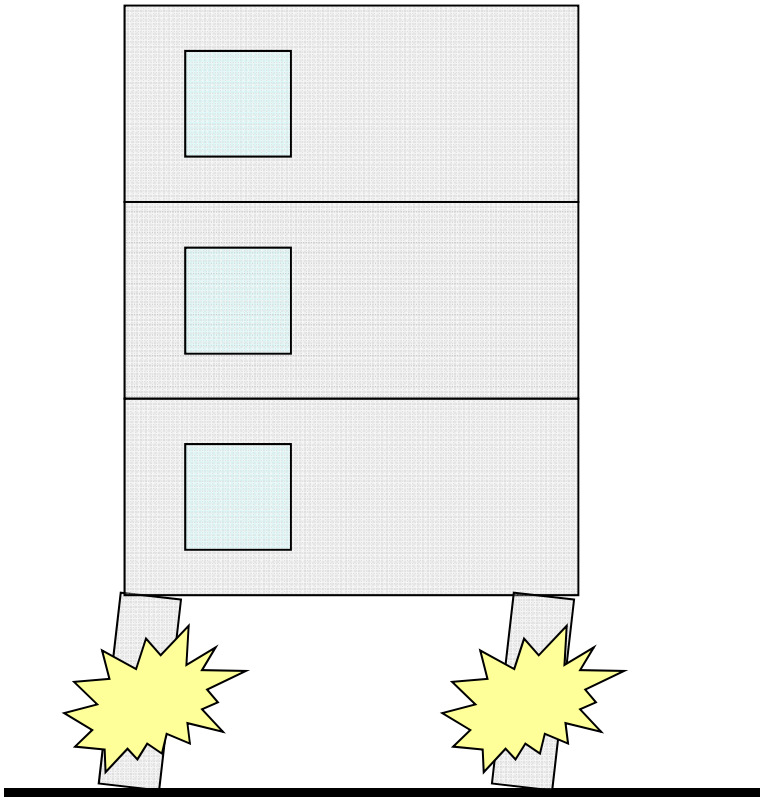
Consideration of Story Deformation Angle

Floor with significant deformation

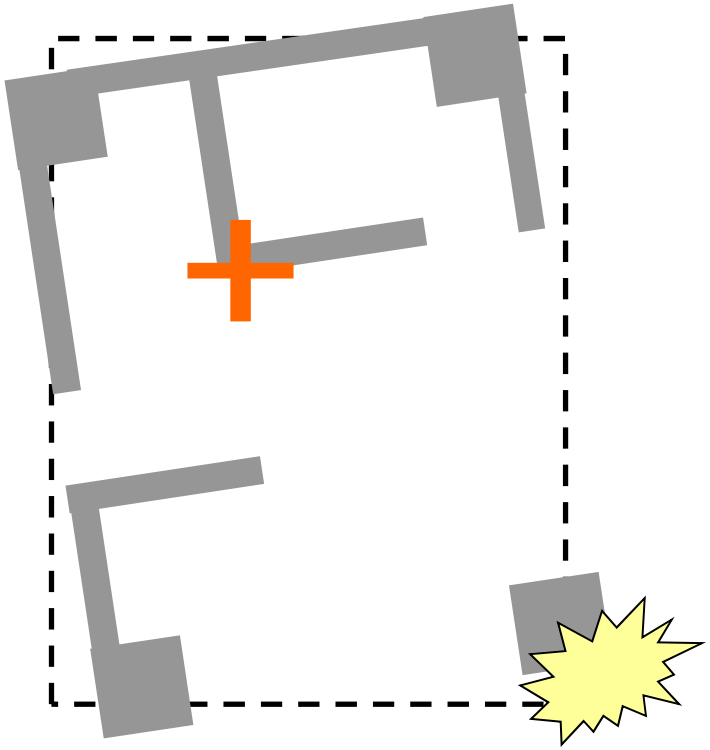


Story deformation angle: Deformation of each floor

Consideration of Stiffness Ratio and Eccentricity Ratio

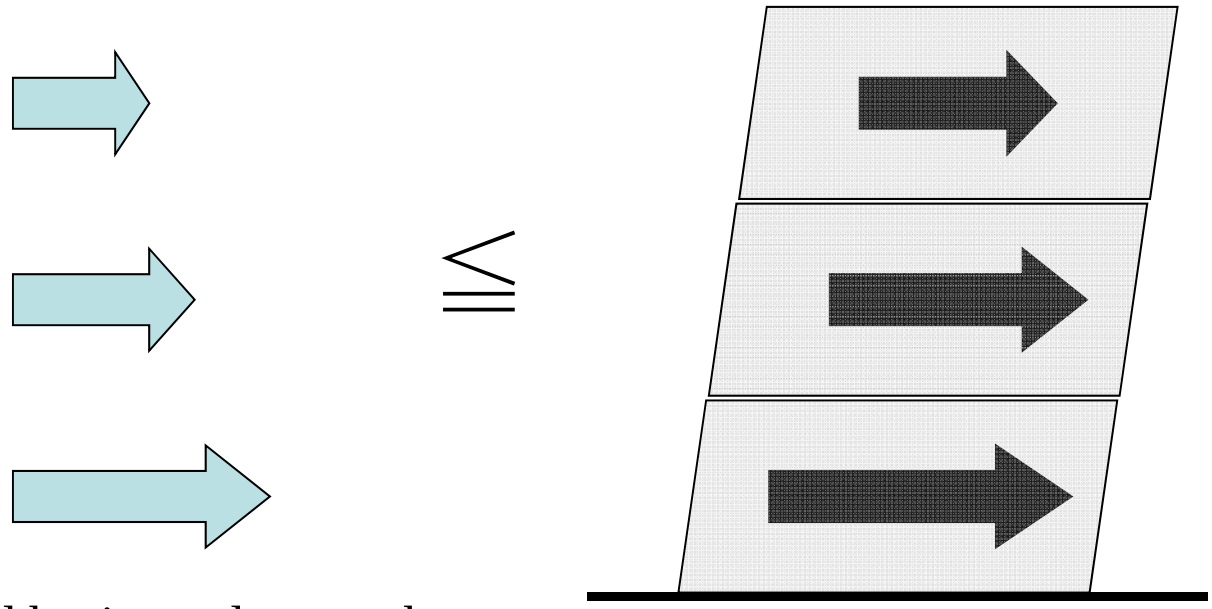


Stiffness ratio: Balance of each floor's stiffness



Eccentricity ratio: Balance of each floor's stiffness in horizontal plane

Retained Horizontal Strength



Required horizontal strength:
Horizontal strength required for each floor in the event of a large earthquake

Retained horizontal strength:
Horizontal force that each floor's columns, beams, and shear walls can bear