

PROPOSAL TO SUPPORT THE MAINTENANCE OF MORE THAN 20-YEAR-OLD BUILDINGS

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ABSTRACT: As to the current situation for the future problems about high-rise and medium-high-rise building in Kitakyushu City, the regular inspections according to the Building Standards Law are well being done. However, the documents of the data are still stored in paper, and can't easily be accessed. The governmental system of the storage is electronically constructed as soon as possible. This report will show you the regular inspection system and suggest the way of new storage of the data.

Keywords: *Aim of Study, Methods of Research, Analysis, Evaluation, Conclusion and Suggestion for the Future Problems*

1. INTRODUCTION

I'd like to discuss the regular submission system of the particular buildings in Kitakyushu City in Japan. (The Building Standards Law in Japan, Article 12-3: A periodic inspection for a particular building and the regular submission system)

According to regulation of the Building Standards Law, a particular building is a building where a lot of people live and use. On account of prevention of accidents and disasters, the regulation requires individual condominium owners of the building as follows: A class-1 or class-2 qualified architect to regularly inspect the state of the building outsides and submit its result to the certain administration. The inspectors have to examine the building's history, site, foundation, outer walls, roof, and building insides.

Kitakyushu City divides these buildings concerned into three areas, specifies apartment buildings with more than 5 stories, and requires an inspection and report every 3 years.

[1]

Three areas are as follows:

- I. Apartment houses and hospitals in Moji Ward, Kokura-Mimami Ward, and Tobata Ward
- II. Apartment houses, hotels, Japanese inns, and restaurants in Wakamatsu Ward, Yahata-Higashi Ward, and Yahata- Nishi Ward

III. Apartment houses, department stores, and supermarkets in Kokura-Kita Ward

The period of report submission and the required buildings vary in prefectures and cities throughout the country. Moreover, the regular submission system was amended on April 1, 2008 and requires a sound inspection of all the outer walls every 10 years.

2. AIM OF STUDY

Kitakyushu City itself has hundreds of buildings requiring the regular inspection and report submission. By taking care of these data on the server, when these buildings are repaired, rebuilt, enlarged and downsized, the latest information along with their history and the improving plan will be well managed for a long time.

3. METHOD OF RESEARCH & ANALYSIS

I've been putting into practice and reporting 65 buildings in Kitakyushu City for the last 3 years. Concerning a lot of these data and analyses, I can suggest the best way to examine, to repair, to reform, and to rebuild the buildings in the future.

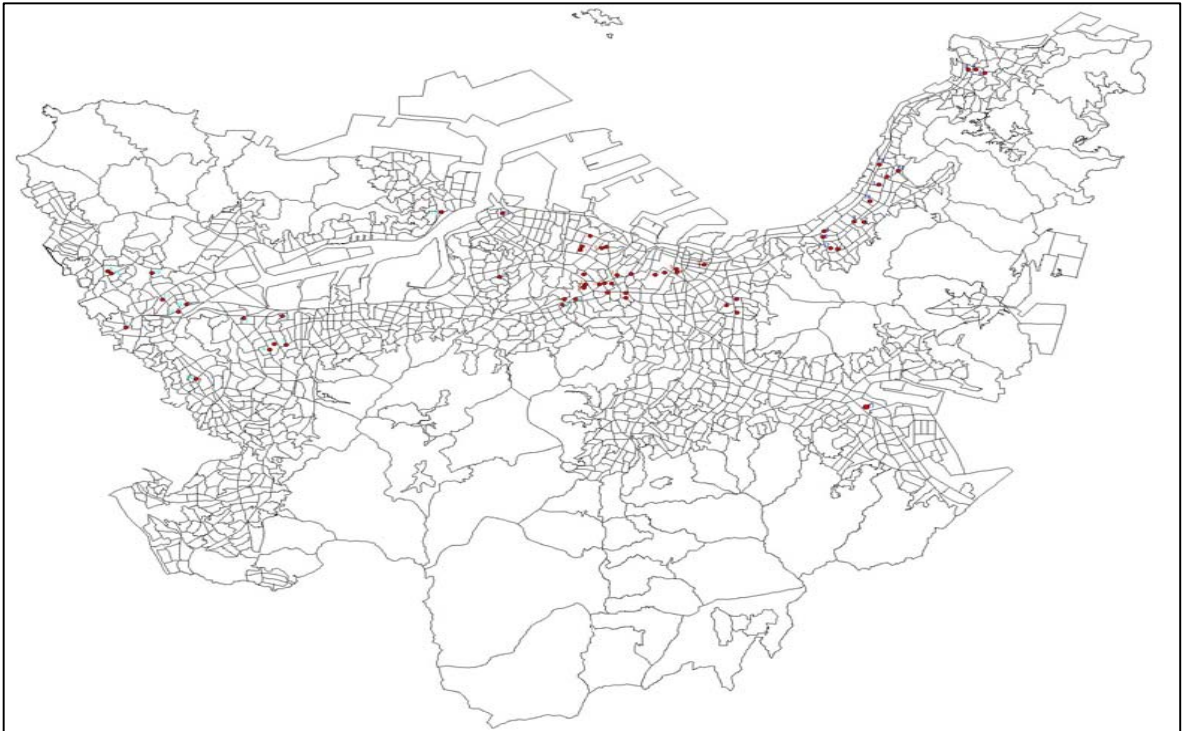


Fig.1 Red dots show the places where the buildings were inspected

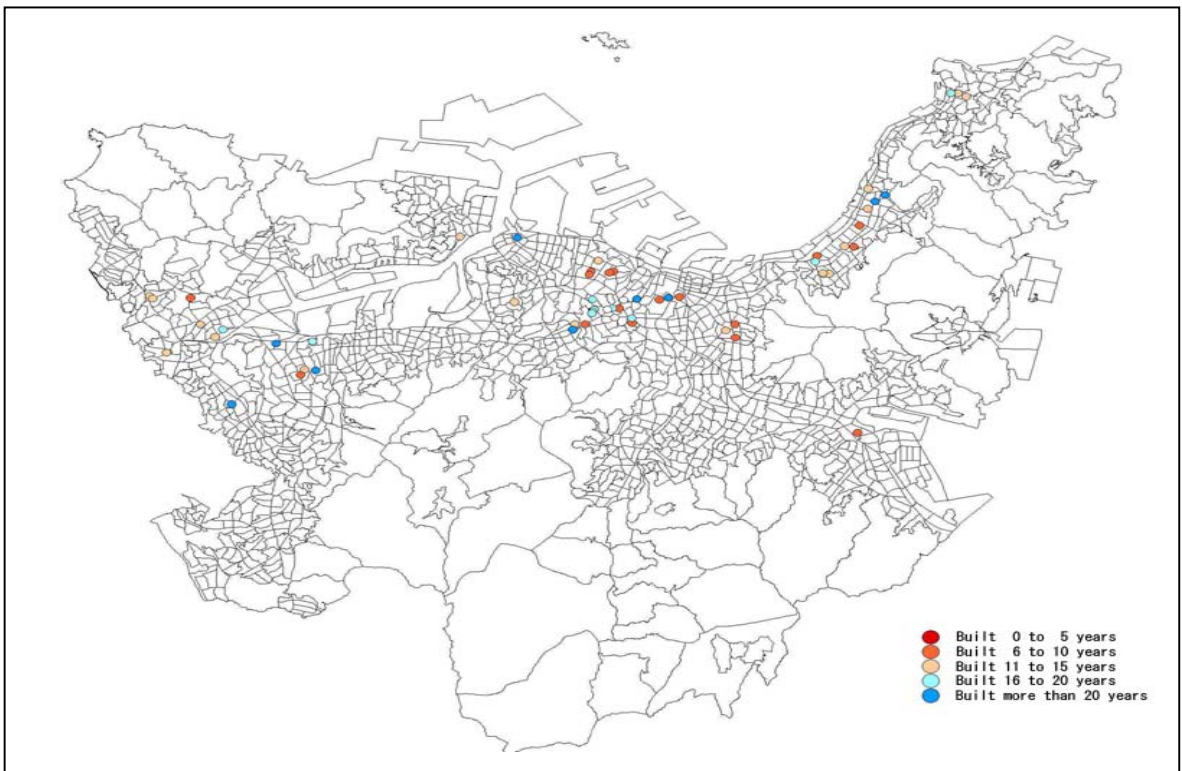


Fig.2 Grouping by the year and month of completion of the building

Table.1 Examples of inspection items

Inspection Results						
Inspectors	Name		No. of Inspector			
	Chife of Inspectors					
	Other Inspectors					
No.	Inspection Items		Inspection Results			No. of Inspector
			Fine	Correction needed	Ill-formed	
1	Site and ground					
(1)	Ground	Subsidence and Slat				
(2)	Site	Drainage				
(3)	Passage in the site	Establishment of passage				
(4)		Wide enough				
(5)		Obstacles on the passage				
(6)	Fence	Anti-earthquake measures for piled up fence and RC blocks				
(7)		Degradation and Damage of piled up fence and RC blocks				
(8)	Retaining Wall	Degradation and Damage of retaining walls				
(9)		Maintenance of draining off pipes				
2	Outside Walls					
(1)	Groundwork	Subsidence of groundwork				
(2)		Degradation and Damage of groundwork				
(3)	Groundsill (Wooden buildings)	Subsidence of groundsill				
(4)		Degradation and Damage of groundsill				
(5)	Building Frame	Anti-fire prevention measures for doors or windows				
(6)		Degradation and Damage of wooden frame				
(7)		Degradation and Damage of brick frame				
(8)		Degradation and Damage of RC frame				
(9)		Degradation and Damage of steel frame				
(10)		Degradation and Damage of RC and SRC frame				
(11)	Outside wall finish materials	Degradation and Damage of outside walls made by tile, stone (except dry process method),mortar				
(12)		Degradation and Damage of outside walls made by tile, stone (dry process method)				
(13)		Degradation and Damage of metal panels				
(14)		Degradation and Damage of concrete panels				
(15)	Window Sash	Degradation and Damage of sash				
(16)		Fixed window glass				
(17)	Poster Column	Degradation and Damage of main body				
(18)		Degradation and Damage of supporting part				
3	Roof Top and Roof					
(1)	Roof top	Degradation and Damage of roof top surface				
(2)	Roof circumference	Degradation and Damage of parapetto				
(3)		Degradation and Damage of mortar top parapetto				
(4)		Degradation and Damage of steel top parapetto				
(5)		Degradation and Damage of drainage				
(6)	Roof	Anti-fire prevention measures for roof				
(7)		Degradation and Damage of roof				
(8)	Equipments and works	Degradation and Damage of main body and joint parts of equipments and works				
(9)		Degradation and Damage of supporting parts				

Inspection items of the buildings are grouped into 6 categories

- (1) Site and ground
- (2) Outside walls
- (3) Roof top
- (4) Building insides
- (5) Emergency safety structure
- (6) Others

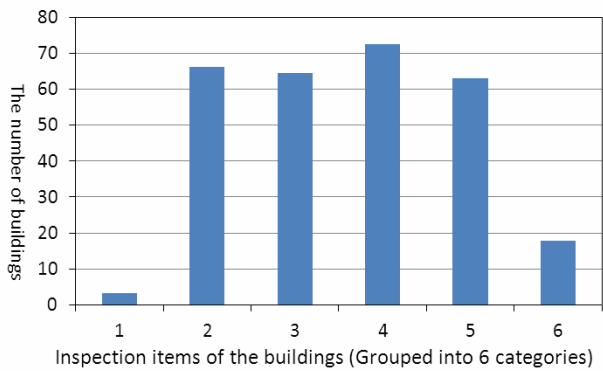


Fig. 3 Numbers of degradation of the buildings

Figure 3 shows the example of Inspection Result Table. This table indicates that there is a large possibility of disorders happening as to inspection items 2-5.

Example photos of degradation are shown as follows;

1 Example photos of site and ground



Fig. 4-1 Cave-in on the ground



Fig. 4-2 Crack in the concrete base of a water receiving tank

2 Example photo of outside building



Fig. 5 Crack in the concrete outside wall

3 Example photo of roof top



Fig. 6 Crack in the concrete parapetto on the roof top

4 Example photo of building insides



Fig. 7 Obstacle on fire prevention shutter

5 Example photo of emergency safety structure



Fig. 8 Rust in the reinforced concrete at outside stairs

6 Example photo of others

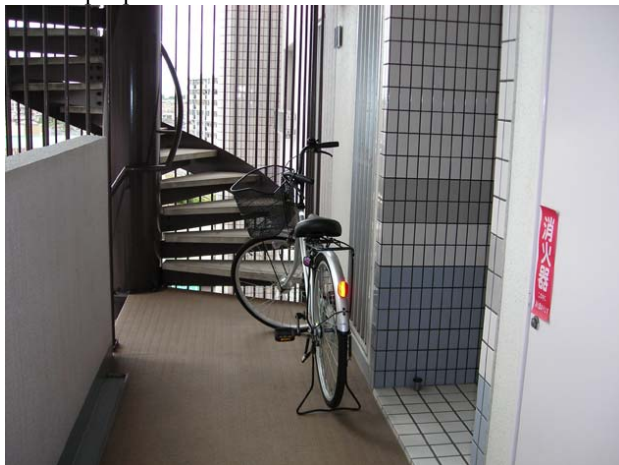


Fig. 9 Obstacle on the passage

The latest data respectively should be kept on the server in order to make and manage files for the inspections on outer walls. The inquiry by the customers will be dealt with quickly.

On April 1, 2008, the Building Standards Law was amended to require a sound inspection for all the outer walls of the particular buildings in its regular submission. Though regular sound tests were required before April 1, 2008, the Law didn't stipulate penalties for negligence. Besides regular sound tests, this new regulation demands the additional inspection 10 years after completion of the buildings or repairs of outer walls. It also punishes condominium owners with a fine of less than one million yen, if they neglect the regular report and make a false statement.

■ Buildings requiring sound tests on all the outer walls

- ① Buildings with disorder found by regular partial sound tests and observation
- ② Over 10-year-old buildings
- ③ Buildings over 10 years after outer walls have been repaired
- ④ Buildings that present a danger to pedestrians after a sound test was given 10 years prior, and another sound test was given recently.

■ BEFORE AND AFTER AMENDMENT

◆ Before amendment

By a partial sound test and checking with observation, when an inspector finds disorders, he may give advice to the owner of the building to "make a close investigation."

◆ After amendment

By a partial sound test and checking with observation, when an inspector finds disorders, he must continue the entire sound test of outer walls. In addition, for the first inspection 10 years after completion of the building or repairs of outer walls, checking the entire outer walls should be carried out.

4. CONCLUSION

The degradation of buildings is unavoidable, so that we should build up the system which enables us to make buildings sustainable, and to manage and grasp their maintenance for a long time. One suggestion is that documents written in paper now should be stored electronically. In order to preserve buildings through centuries, data of regular inspections and history of architectural design, construction, repairs, and maintenance should remain for a long period of time. There, a manager or a constructor can easily have access to the data anytime, get to know its history and take appropriate action. The way of the governmental maintenance should be suggested and its system should also be designed.

REFERENCES

[1] The regular submission system of the particular buildings in Kitakyushu <http://www.teikihoukoku.info/chosahiyou.html>