

The actual conditions and issues regarding maintenance and renewals of facility plumbing for the long-term use of apartment houses

FUJIMOTO Hidekazu, Head, Housing Planning Division, Housing Department

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1. Introduction

As resource and environmental issues become more urgent, the construction of quality housing and its inheritance is becoming increasingly important. Measures for the maintenance and renewals of facility piping is essential for maintaining the standard of living in apartment houses, and is also an evaluating item in housing performance indications.

This study is aimed to provide technical data for rationalization of the evaluation criteria for the maintenance performance of the facility piping. This year, we have surveyed the actual conditions of the maintenance and renewals of facility piping, and organized the issues to rationalize them.

2. The actual conditions of the maintenance and renewals of facility piping

(1) The specifications and construction method of facility piping etc. of apartment houses

Implementation of the maintenance and renewals of facility piping is affected by the building form, floor height and floor plan etc., in addition to the specifications and construction method of the facility piping. The table shows the specifications and construction method of apartment houses arranged and exemplified according to its construction age.

(2) The actual conditions and issues of the maintenance and renewals of facility piping

The actual conditions and issues of the maintenance and renewals regarding water supply and drainage pipes were investigated. In recent years, the following cases of

renewals have been confirmed.

1) The drainage piping joints are pulled out from the concrete floor slabs and renewed using hydraulic jacks to suppress vibration and noise during the work.

2) The facility piping under the floor slabs of dwelling units are renewed and piped above the floor slabs.

On the other hand, the increase in cost compared to standard construction methods, and the allocation of these costs between the home-owner's associations and unit owners (individual households) are becoming issues.


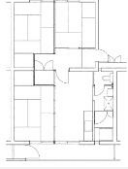



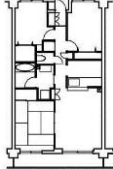

(3) The building design data of authorized long-life quality housing

For the purpose of grasping the planning technology, the specifications and construction methods of facility piping etc. for newly built apartment houses for long-term use, case studies of authorized long-life quality housing (apartment houses) were conducted and the building design data was arranged. Even in these cases, the ratio of common drainage stacks being placed inside the dwelling units was high, which can be pointed out as an issue in terms of maintenance and renewal.

3. Future works

The evaluation standards of the maintenance and renewal measures of facility plumbing pertaining to housing performance indications are being continuously reviewed and rationalized. We will continue to grasp the actual conditions and arrange the issues of the maintenance and renewals, in order to arrange the technical references and reflect it in future technical standards reviews.

Table: Example of the specifications and construction method of the apartment houses according to its construction age

Specification model	1960s model Pre-1970	1970s model		1980s model		1990s model 1991 - 2000	2000s model Post 2001
		A: 1971 - 1980	B: 1971 - 1980	A: 1981 - 1990	B: 1981 - 1990		
Structure/scale/access	RC box frame/mid-rise/ Staircase	RC box frame/mid-rise/ Staircase	RC rigid frame/ Mid/high rise/corridor	RC box frame/mid-rise/ Staircase	RC rigid frame/ Mid/high rise/corridor	RC rigid frame/ Mid/high rise/corridor	RC rigid frame/ Mid/high rise/corridor
Example of dwelling unit plan	Housing corporation/3DK 	Housing corporation/3DK 	Private sale/3LDK 	Housing corporation/3LDK 	Private sale/3LDK 	Private sale/3LDK 	Private sale/2LDK 
Story height	About 2,550mm	About 2,600mm	About 2,600mm	About 2,650mm	About 2,650mm	About 2,700mm	About 3,000mm
Floor slab thickness	About 110mm	About 130mm	About 130mm	About 150mm	About 150mm	About 180mm	About 260 - 320mm
Seismic resistance	Old seismic standards (Note)	Old seismic standards (Note)	Old seismic standards	Current seismic standards	Current seismic standards	Current seismic standards	Current seismic standards
Water supply pipe	Hot dip galvanized steel pipe/Screwed joint	Rigid polyvinyl chloride lined steel pipe /Resin coating coupling		Rigid polyvinyl chloride lined steel pipe /Resin coating coupling		Rigid polyvinyl chloride lined steel pipe /Pipe edge corrosion protective coupling /Stainless steel pipe/Mechanical joint	
Drain pipe	Cast iron pipe, Carbon steel tube /Drainage fitting	Cast iron pipe, Carbon steel tube /Drainage fitting		Cast iron pipe, Tar epoxy lined steel pipe, Rigid polyvinyl chloride lined steel pipe /Mechanical joint		Cast iron pipe, Fire resistant double layer tube, Tar epoxy lined steel pipe, Rigid polyvinyl chloride lined steel pipe /Mechanical joint	
Bathroom/piping	Conventional /under the slab	Conventional /under the slab	Conventional /under the slab	UB/above the slab	UB/above the slab	UB/above the slab	UB/above the slab
Floor level difference in dwelling unit	Yes	Yes	Yes	Yes	Yes	None	None
Hot-water supply apparatus	BF Bath boiler	BF Bath boiler with Hot water supply/shower function	BF Bath boiler with Hot water supply/shower function	Hot water supply heating machine No.13/No.16	Hot water supply heating machine No.13/No.16	Hot water supply heating machine No.24	Latent heat recovery type hot water supply heating machine No.24
Energy conservation	—	—	—	1980 Standards	1980 Standards	1992 Standards	1999 Standards

(Note): RC box frame structure even designed based on the old seismic standards, is often meet the current seismic standards.