

Seismic Vulnerability of Multi-storey Residential Buildings of Almaty City, Republic of Kazakhstan

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SUMMARY

Almaty city is the former capital of the Republic of Kazakhstan in the central Asia, with the population of 1.2million. The city is the center of commerce, finance and culture of the country. The south-east area of the country including Almaty had been suffered earthquake damages in the past. To mitigate the probable damages caused by big earthquakes in the future, this survey project "A survey of earthquake disaster mitigation measures and plans for Almaty city" funded by Japan International Cooperation Agency (JICA) was conducted.

Seismic risk map is prepared as a result of damage assumption by earthquakes. This is executed generally by the evaluation and analysis of scenario earthquakes, base-rock motion, and surface ground motion which is expressed by seismic hazard maps. Then damage assumption of buildings, human casualties, infrastructure and lifelines is prepared as seismic risk maps.

Number of multi-storey residential buildings has increased since 1950's with the economic growth of the Almaty during the former Soviet Union age, and currently 80% of the population is living in 8,800 multi-storey residential buildings.

Because of the lack of data concerning the structural type and vulnerability necessary for building damage assumption, a building sampling survey was conducted by selecting 320 multistory residential buildings randomly. Existing multistory residential buildings are categorized into brick masonry, wooden, reinforced concrete, and total 7 structural types.

Building damage function showing vulnerability of multistory residential buildings is prepared utilizing Seismic Index of Structure, I_s , by the seismic evaluation of Japanese code for reinforced concrete structure. Then a risk map of earthquake damage assumption for multistory residential buildings, which is the simulation result, is estimated.

In this paper, vulnerability assessment of existing multistory residential buildings and building inventory will be introduced mainly, together with the seismic hazard map and risk map as a part of earthquake disaster mitigation plans of a developing country.

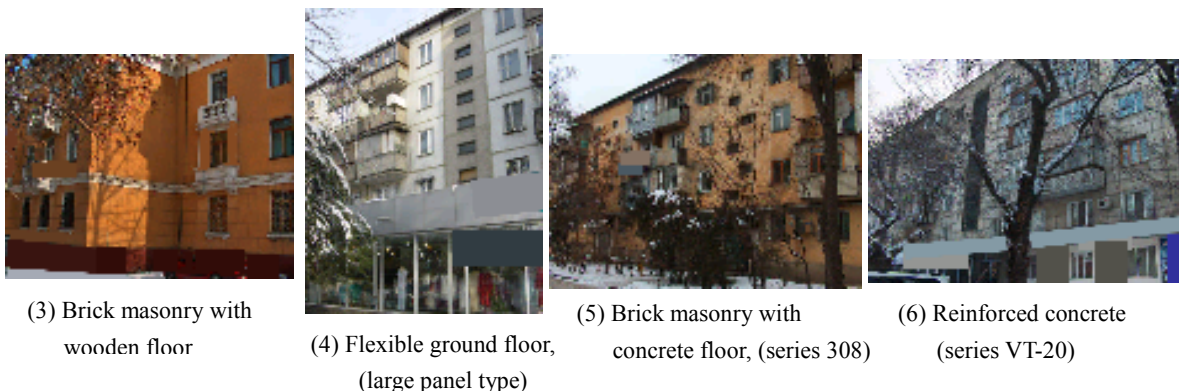


Figure External view of multistory residential buildings