

Development of the Seismic performance evaluation methodology



— Evaluation of the amount of crack length and width —

Public needs to seismic performance

I want to continue to live in my own house after earthquake disaster... (inhabitant)

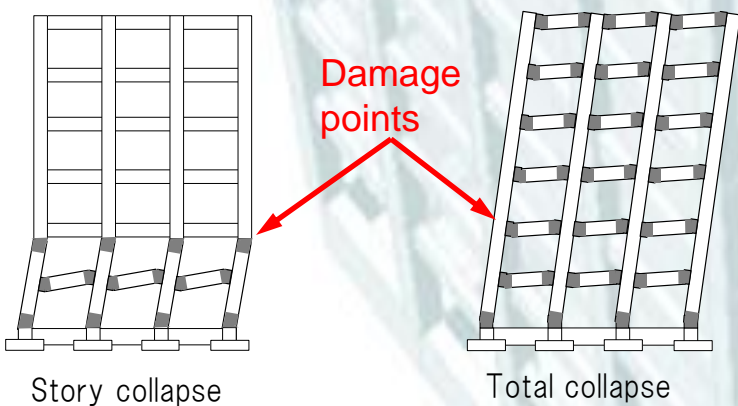
Even if the severe earthquake happens, we want to avoid the damage of the building and continue business. (administrator)

Need of seismic performance evaluation of buildings based on damage and repair costs

Performance evaluation of earthquake resistant R/C buildings

Serviceability limit state	Crack width < 0.2mm
Repair is not need. Continuously available.	
Repairability limit state 1	Crack width < 1.0mm
Need to easy repair	
Repairability limit state 2	Crack width < 2.0mm
Need to extensive repair	
Safety limit state	Crack width > 2.0mm
Keep axial force at EQ.	

Difference of collapse type of building



✗ Large risk of Collapse of building.

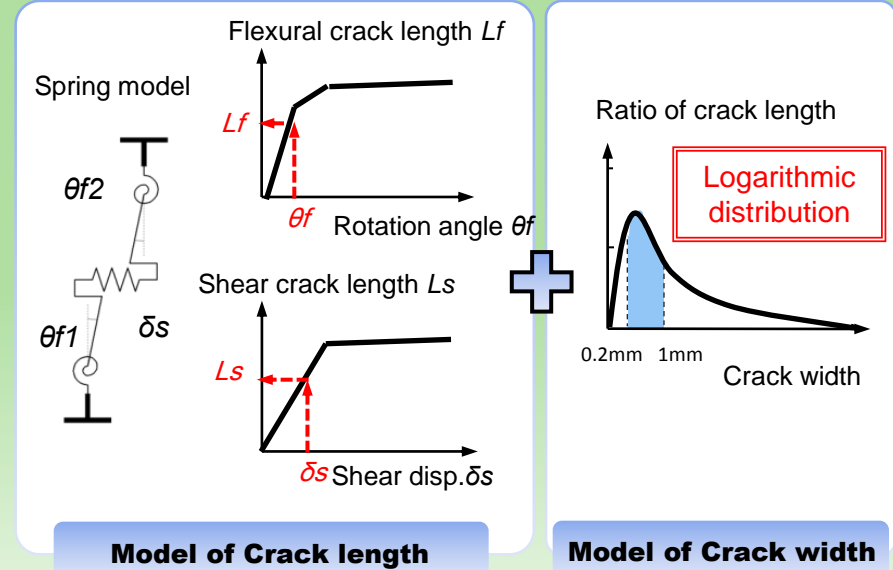
○ Low repair cost.

○ Low risk of Collapse of building.

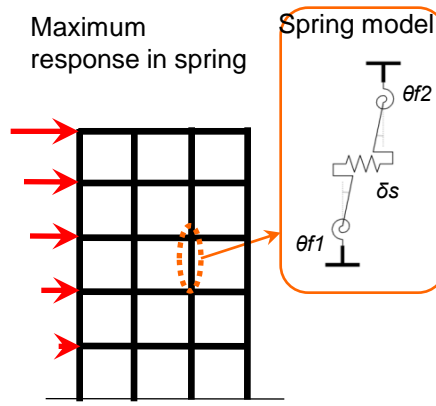
✗ High repair cost.

Procedure of damage evaluation of Buildings

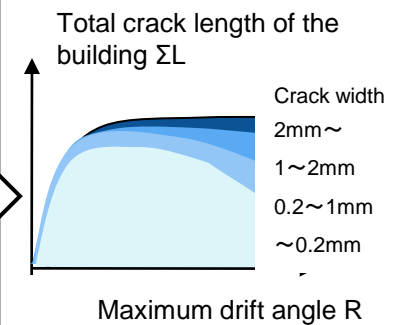
Evaluation model of the amount of crack



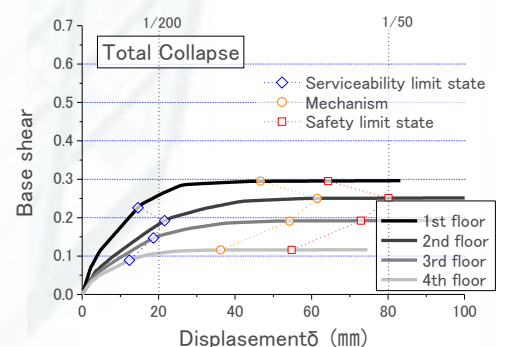
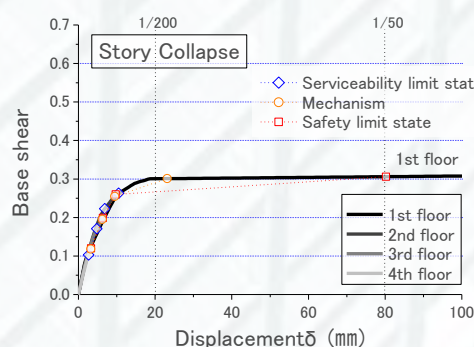
Frame Analysis



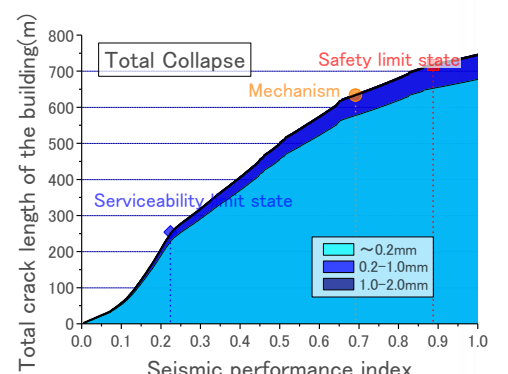
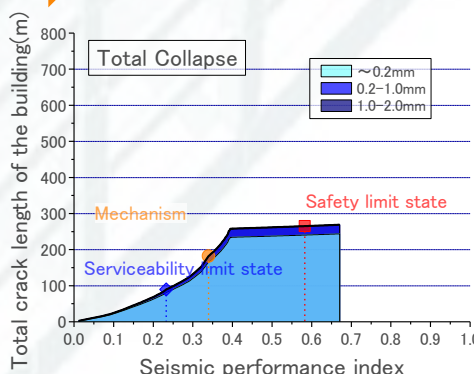
Evaluation of the amount of crack



Damage of buildings which differ from Collapse type



Maximum shear forces of these frames are equal.



However, damages of these frames are different.