

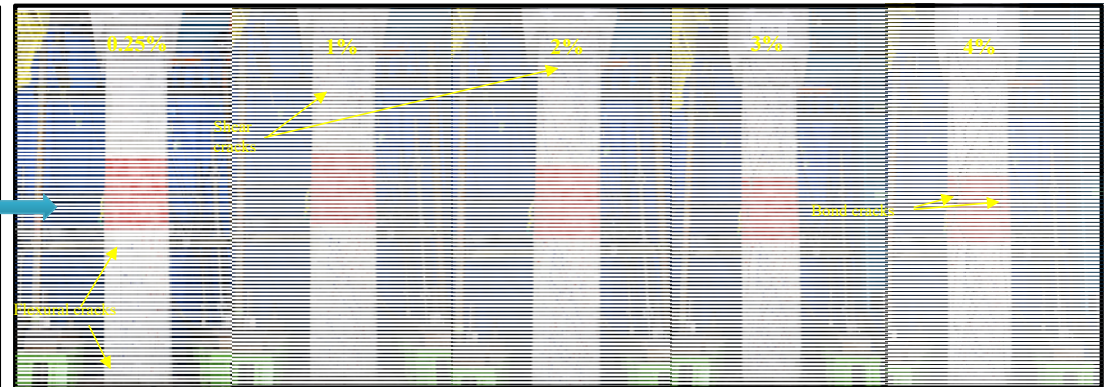
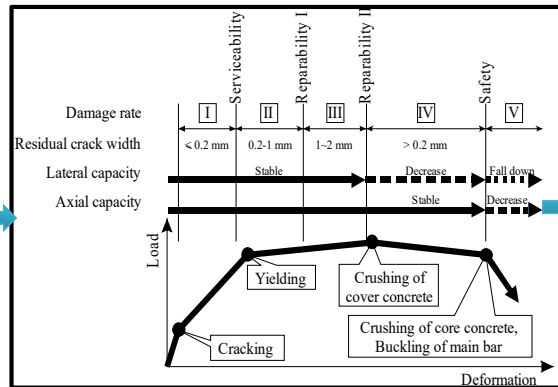
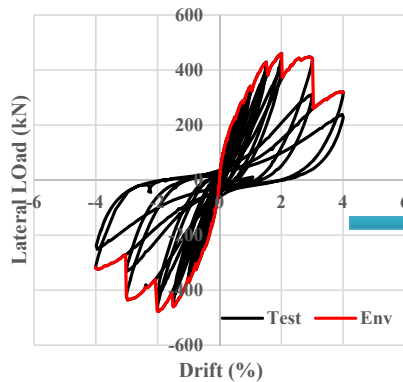
Background

Serious degradation mechanisms can severely reduce the service life of concrete structures: steel reinforcement can corrode, cement matrix can be attacked, and even aggregates can show detrimental processes. Therefore, it is important to understand how damage can occur to concrete structures and to appreciate the timing of the actions leading to damage.



Results

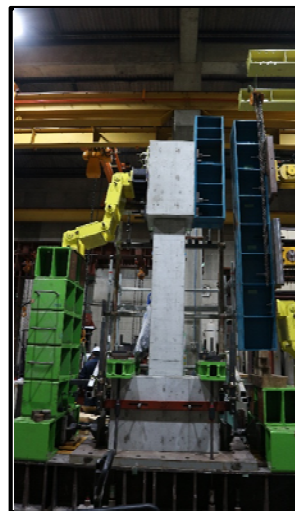
The damage evaluation of the specimen was conducted according to the cracking patterns and the residual cracks observed during the test. Figure below explains cracking patterns from light to severe limit state. Small flexural cracks were initiated under lower limit states (serviceability limit). When the drift angle (Reparability limit) increased the shear crack start to develop in both ends of the beam. At higher drift (Reparability II), extensive shear cracks with inclined angle 45 degree were developed while bond cracks were formed in both sides.



Damage to Concrete Structures summarizes the state-of-the-art information on the degradation of concrete structures, and gives a clear and comprehensive overview of what can go wrong.

Degradation mechanisms are illustrated with numerous real-world examples and many drawings and photographs taken of actual structures.

Damage of structural member such as beam and column can be classified in to four limit states (Serviceability, reparability I and II and Safety limit states).



At the Safety limit states, The bond cracks along the longitudinal bar were clearly observed. The spalling of concrete along the bond crack was observed. At this stage the specimen had reached the failure.

Conclusions

At very early stage, flexure cracks were categorized at serviceability limit states. However, at the final stages shear cracks and bond cracks extended and became wider and the damage classified safety.

Contribution to Society

Under seismic events, the damage and failure of RC structure can be controlled by understanding the performance of the frame element in each level.

Objectives

The aim is to assess the damage of RC beam subjected to seismic loading. The evaluation of damage is conducted according the AIJ guidelines .

