

Structural Engineering for Urban Safety

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FINAL GOAL: Advanced Structural Concrete Mechanics and Design

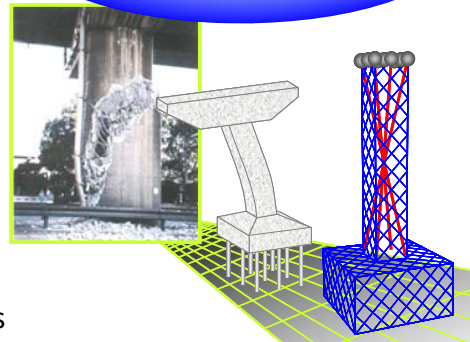
Aging Structures

- Steel Corrosion
- Alkali-Silica Reaction (ASR)



Example: **Corroded reinforced concrete** beam and its evaluation by loading tests and extensive observations

Nonlinear Analysis



New Materials

Steel fiber reinforced concrete (SFRC)

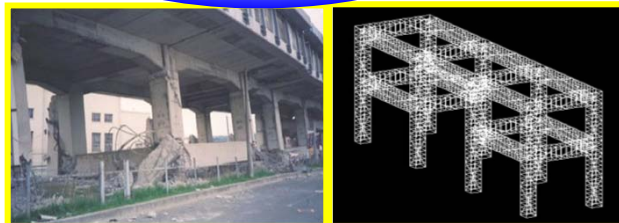


Ultra-high strength fiber reinforced concrete (UFC)

-Steel fiber
 $\phi=0.2\text{mm}$, $L=15\text{mm}$
 $f_u=2500\text{N/mm}^2$

+
 -Cement
 -Silica fume
 -Silica sand

Seismic Performance



Damage of Shinkansen express train viaduct at Kobe earthquake and its seismic performance re-evaluation by using **3D Lattice Model**

Experiment with Image Analysis

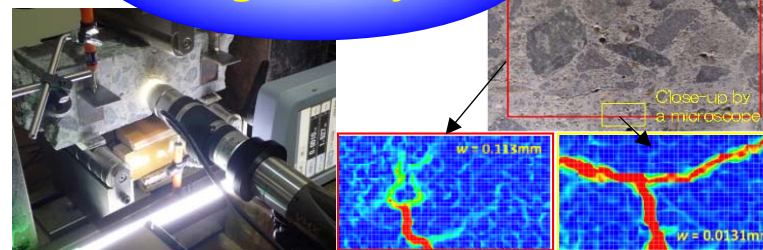


Image based detection for concrete fracture

Fracture properties of concrete damaged due to **ASR** in tension was evaluated based on loading tests and **an image analysis**.

New Technology

Design and application in the seismic regions

- Prestressed Concrete
- Precast Concrete structural members