



Seismic Performance of RC Columns Using Round Steel Bars as Longitudinal and Additional Bars

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Research Fields Reinforced Concrete Structure, Seismic Structure

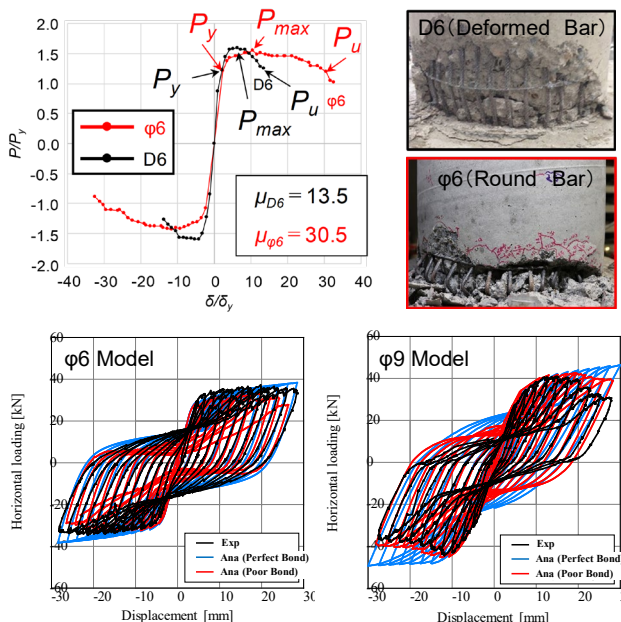
Keywords RC Column, Cyclic loading, Bond Behavior, SHCC

Background and Purpose

- In the Specifications for Highway Bridge - Part V Seismic Design (2017), the suggestion of the new technique to improve of deformation performance in the RC columns at the time of an earthquake is needed.
- In this study, cyclic loading tests and fiber model analyses were performed to investigate the seismic performance of RC columns using round steel bars as longitudinal and additional bars.

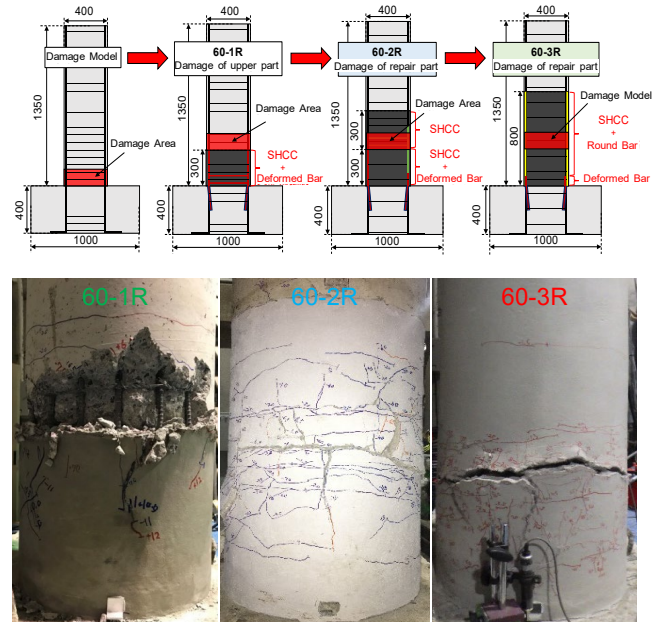
Using round bars as longitudinal bars

- Maximum strength of $\phi 6$ model which were fully scaled agree well with D6 model. Improvement of the deformation performance is shown in $\phi 6$ model compared with D6 model.
- From analysis results, $\phi 6$ model may behave perfect bond. Early strength drop of $\phi 9$ model used lager diameter longitudinal bars is caused by the unbonding of round steel bars.



Using round bars as additional bars

- Repair performance of SHCC which shows spalling restraint effect by short fibers is investigated.
- Damage area is controlled by using additional bars to perform multiple repair tests.
- Repaired models used round bars and SHCC show the improvement of deformation performance while controlling the maximum strength.



Approach in the future

- The most appealing point of this study is using round steel bars as additional bars which can control the strength by early unbonding between steel bars and concrete.
- RC columns which minimize residual displacements will be proposed by using ultra high strength steel bars which shows the early unbonding as longitudinal steel bars.