# Seismic Performance of Reinforced Concrete Structural Walls

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## Background

RC structural walls are used as lateral force-resisting system in building because of their stiffness and strength.

Rectangular walls with confined end-regions were extensively used instead of walls with boundary columns

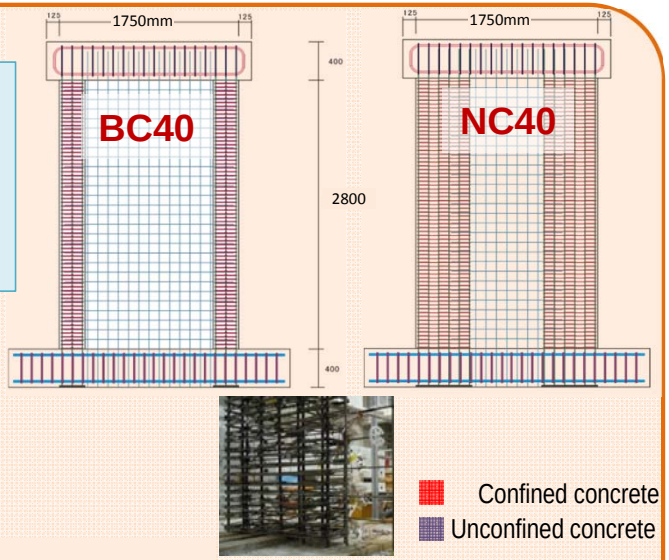
➡ Damages to RC Walls following the 2010 Chile and the 2011 New Zealand earthquakes

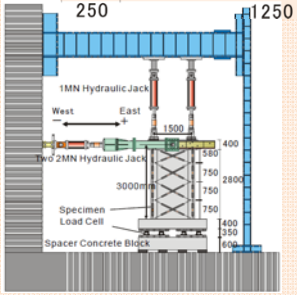

## Experimental study

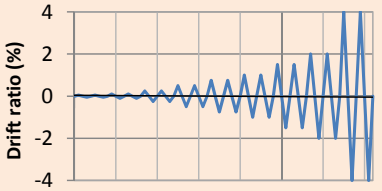
Wall specimens with similar total area of wall sections, the area of confined boundary regions and the moment capacity were set equal for all specimens

| Wall | f'c (MPa) |
|---|---|
| BC40 | 59.5 |
| NC40 | 52.5 |

| Reinf. | fy (MPa) |
|---|---|
| D6 | 387 |
| D10 | 377 |

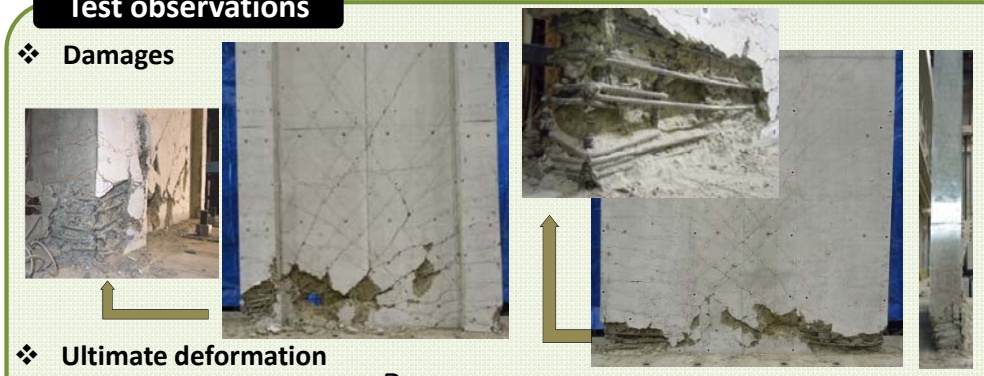


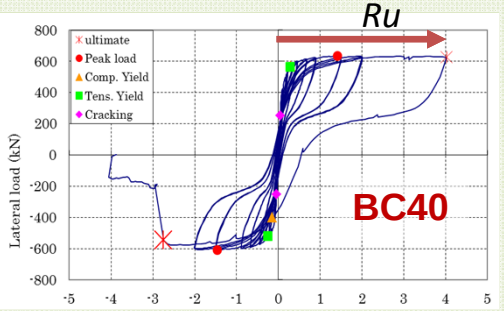



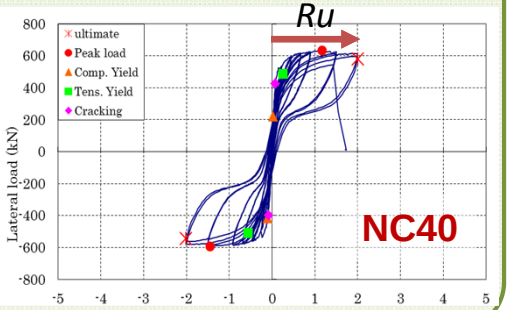

## Test observations

❖ Damages

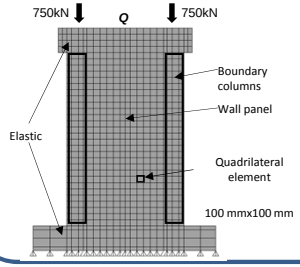


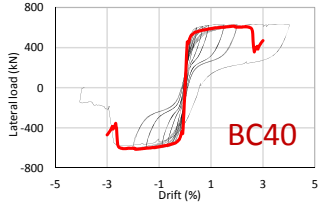
❖ Ultimate deformation

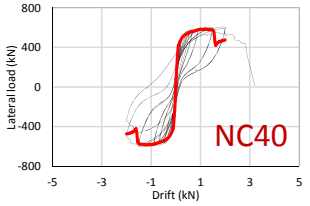



## FEM Analysis




## Conclusions

Boundary columns can effectively enhance the wall performance by increasing its ultimate deformation capacity and reducing damage level.

Proposed FEM model is able to simulate the entire nonlinear behavior of the wall until the ultimate deformation capacity.

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