Reinforced Concrete Behavior Modeling with Fiber Model Analysis

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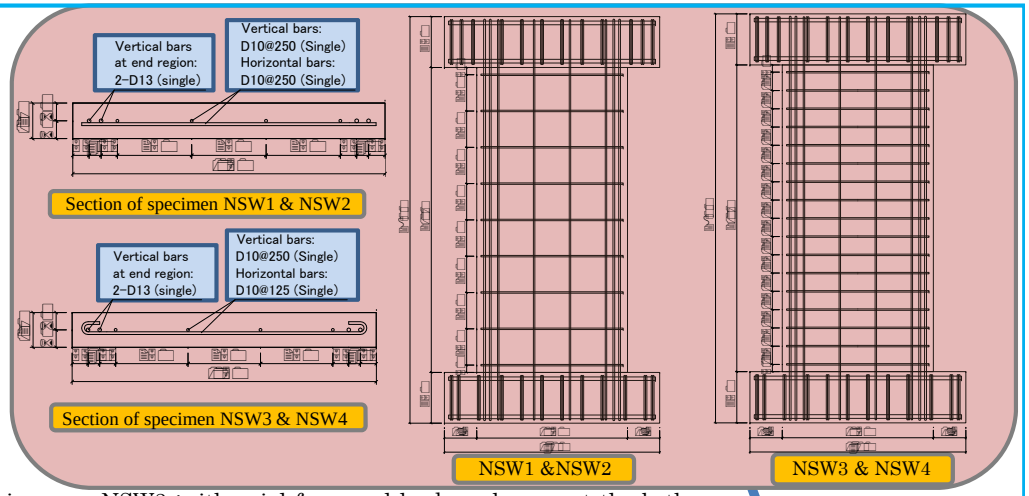
Introduction

In the 2011 Tohoku Earthquake, many reinforced concrete (RC) walls suffered severe damage. Some experimental studies were conducted for better understanding of lightly RC behavior. Experiment takes a lot of effort, cost, and time, hence analytical model is needed to predict the results easily.

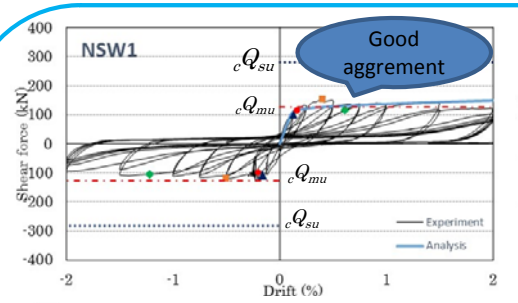
Analytical model also needs a precision with high accuracy. The aim of this study is to predict the behavior of reinforced concrete using fiber model

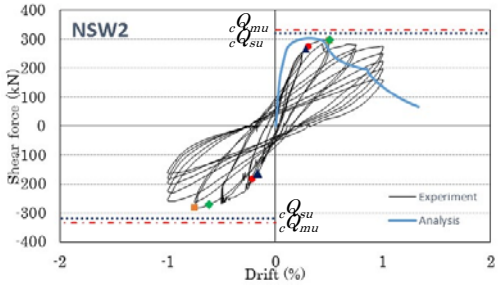
Specimen

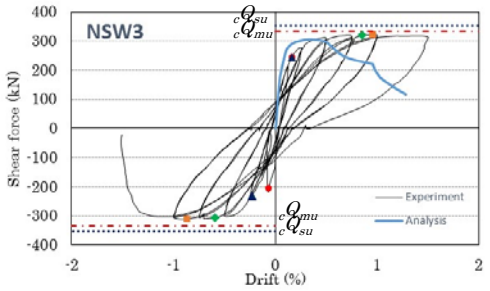


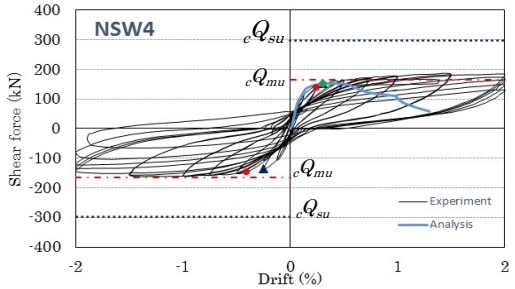
NSW :A prototype wall specimen
NSW1 :no axial force
NSW2 :with axial force
NSW3 :with axial force and hook anchorage at the both end of horizontal bar.
NSW4 : same with NSW3 but using cantilever system

Results









Force – Drift Relationship

Conclusion

Fiber model cannot predict the lightly RC behavior with high accuracy. Only 1 of 4 results agreed with experimental results. For the other results it can only predict the maximum force but cannon predict the deformation.

Modeled

Horizontal load is applied to get Force-Drift relationship

Section of NSW 1-4 was modeled using a fiber model