

Research Title: SHEAR CRACKING PREDICTION MODEL FOR RC BEAMS WITH SIDE-FACE REINFORCEMENT

Master Student 2: Irish Sultan Tambis

Engineering for Maintenance System Laboratory, Division of Engineering and Policy for Sustainable Environment, Hokkaido University

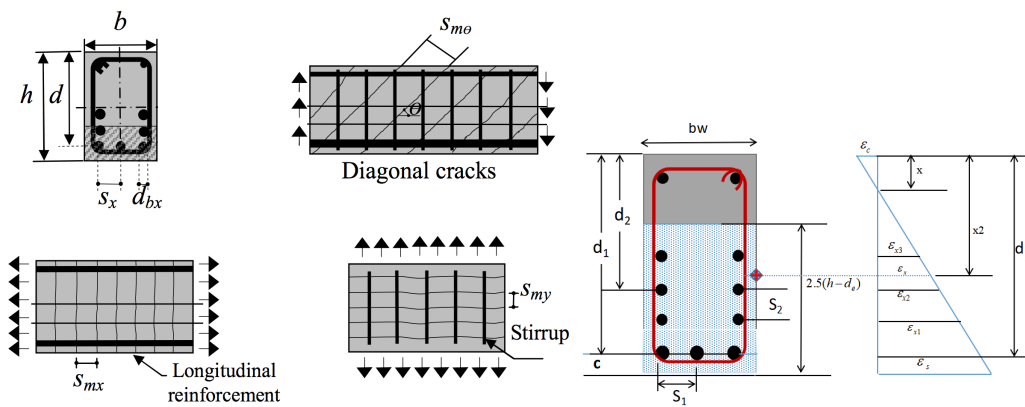
Email: tambisirish@yahoo.com

Supervisor: Prof. Ueda Tamon and Prof. Dawei Zhang

This research aimed to evaluate the shear crack displacement (crack spacing and crack width) of the reinforced concrete beams with additional horizontal reinforcement along sides. Current prediction model does not give into account the effects of side face bars on RC beams and therefore will have variation in the results. The proposed prediction model was formulated through modification of the current prediction model by structural codes and previous researchers. A simple, practical and based from geometrical conditions were the basis of modification.

Introduction

Cracking of reinforced concrete (RC) structures is considered undesirable because of the various reasons most particularly its effects on the durability of the structure making the structure unsafe. Horizontal additional reinforcement was introduced along sides to control cracking not only to large concrete members but also to normal size members. Crack spacing and crack width were reduced with side face reinforcement because of the increase bond with the surrounding concrete. The main objective of the study is to develop a rational methodology for predicting crack spacing and crack width of RC beam with consideration on the effect of additional horizontal reinforcement on sides of the beam. The developed model will be compared with the existing experimental database. Verification supported by FEM analysis through DIANA will also be carry on for additional information of the study.



For the additional information of the study, the result of the prediction model will also be verified by numerical analysis through the Stiffness Adaptation Analysis of DIANA. The stiffness adaptation analysis with application (*STADAP) is proposed to be an alternative for a full nonlinear analysis with application (*NONLIN) for calculating load distributions, deformations, crack patterns, and crack-width in reinforced concrete structures.

