

## ABSTRACT

MERRY NATALIA MARANATA (02120010008)

### THE ANALYSIS OF INTERACTION DIAGRAM REINFORCEMENT COLUMN WITH CARBON FIBER REINFORCED POLYMER

(xxvi+174 pages: 22 tables, 77 figures, 8 appendixes)

Column is a structural element of building that receives axial and flexural load. Damage or under-designed column require upgrading to enhance axial load capacity and flexural capacity.

CFRP is a new composite material for strengthening method that should be considered as an alternative, because of its light weight and high tensile strength. Though the price of strengthening column with CFRP jacketing is relatively more expensive than concrete jacketing and steel jacketing, but the application and installation of CFRP material jacketing is easier than the other strengthening methods.

Visual Basic is a great programming tool that can be utilized to compute and draw the interaction diagram of column. There are 4 interaction diagrams that have been created with Visual Basic program. The first diagram uses the compressive strength of unconfined concrete in its computation, whereas the second one uses the compressive strength of confined concrete with transversal bars and the third one uses CFRP-confined compressive strength, where only the tensile portion of CFRP is taken in to account. The last one is interaction diagram for CFRP jacketing that considered all part of CFRP, i.e., the tensile and the compressive ones. But compressive strength of CFRP is taken as 78% from the tensile strength.

The results from four interaction diagrams show that the increases of maximum axial load capacity are significant. Maximum axial load of confined concrete and confined concrete with tensile CFRP tensile compared with unconfined concrete are 15.53% and 33.53% higher respectively. Whereas the maximum axial load of confined concrete with full CFRP is 46.45% higher than the one of unconfined concrete.

References: 9 (1979 – 2003)