NON-LINEAR ANALYSIS OF SINGLE COUPLED SHEAR WALLS SUPPORTED ON COLUMNS

By

Amir Abd Elfadeel Esmaeil Ghanem

B.SC. Civil Engineering 2010

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE
IN
STRUCTURAL ENGINEERING

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Key Words:
Coupled shear walls supported on columns; Seismic loads; Anon- linear static analysis; finite elements, ANSYS (14) software.

Summary:

Coupled shear walls supported on columns used to resist the lateral loads in high rise building, when the total horizontal length not needed in ground floors, because architectural reasons such as parking requirements. The objective of this research was to observe deflection, propagation of cracking through the whole structural elements of the system in both elastic and post-elastic range, and to study a non- linear finite element analysis with variation in characteristic strength, reinforcement ratio for whole structural elements of the system, and the stiffness of columns with respect to stiffness of wall. Non-linear finite elements program "ANSYS 14", used to study the behavior of 18 samples from coupled shear walls system. The results are reported as effect of characteristic strength, stiffness ratio between column and wall, and reinforcement ratio on the ultimate horizontal load capacity, Maximum drift of the system at top point, Yielding drift of the system at top point, Yielding load capacity of the system, load of first shear cracks, Load of first flexural cracks, and Ductility.

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