C715117 : MAJOR CIVIL ENGINEERING
KEY WORD:
SECOND-ORDER/ELASTIC ANALYSIS/CRACKING/CONCRETE FRAMES

KAJORNSAK MANOSUPSAK : SECOND-ORDER ELASTIC ANALYSIS OF REINFORCED CONCRETE FRAMES CONSIDERING CRACKING EFFECTS. THESIS ADVISOR : PROF. THAKSIN THEPCHATRI, Ph.D. 58 pp.

ISBN 974-633-617-7

This research presents a principle of second-order elastic analysis of reinforced concrete frames considering cracking effects. Geometrical nonlinearity of the member is considered by including axial force effects in formulating the member stiffness matrix. This stiffness matrix has a parabolic variation over the length of the member. Material nonlinearity, on the other hands, is considered by including the crecking effects which are solved by the method of the section analysis. Newton-Raphson method using tangent stiffness approach, then is used for solving simultaneous nonlinear equations. Convergence is accomplished by specifying Euclidian norms to be smaller than convergence criteria requried. Direct increment method is used in each elastic analysis until the structure is unstable.

Results obtained from the presented analysis had shown to be in close agreement with the existing results. Proposed predicted maximum loads are about 5 percent deviated from the others. A computer program using the proposed method, however, is very handy for analyses of rigid reinforced concrete frames in 3 alternative approaches, i.e., first order elastic, second order elastic and second order elastic analysis considering cracking effects.

ภาควิชา วิศวกรรมโยธา ลายมือชื่อนิสิต .....

สาขาวิชา วิศวกรรมโยธา ลายมือชื่ออาจารย์ที่ปรึกษา .....

ปีการศึกษา 2539 ลายมือชื่ออาจารย์ที่ปรึกษาร่วม .....