SUPAT UTHAIWAT : A SKYLINE FRONTAL SOLVER MICROCOMPUTER PROGRAM FOR STRUCTURAL FINITE ELEMENT ANALYSIS. THESIS ADVISOR : ASSI.PROF. ROENGDEJA RAJATABHOTHI, Ph.D. 226 PP.

This research presents a skyline frontal solver microcomputer program for structural finite element analysis. A frontal-skyline method is presented which allows for compact skyline storage while using the frontal method. This method shows a more efficient use of the available core storage that can be used to analyse structures that have many nodes. This in turn could lead to saving in execution time."

The frontal process assembles coefficients of element stiffness matrices and load vectors, and simultaneously reduces those degrees of freedom of nodes which are unconnected with nodes of elements not yet assembled by Gauss elimination. The frontal-skyline method makes use of this basic frontal procedure but allows the front to increase in size whenever core storage is available. For these large fronts which can now include many fully assembled equations, the matrix is placed in compact skyline storage. The results obtained are nodal displacements and element stresses.

Four types of linear (Q4) and quadratic (Q8) isoparamentric structural finite elements can be solved by this computer program which is written in Microsoft QucikBASIC 4.0 language;

- Plane Stress Element (Q4, Q8)
- Plane Strain Element (Q4, Q8)
- Plate Bending Element (Q4, Q8)
- Brick Element (Q4)

The linear isoparametric element is selected as elements for shear wall behavior representation. The cases studied in this research show that increasing the size of core storage leads to saving in the execution time.