APPENDIX 1

Fig. A1.1: Flow Chart for Main Program
Fig. A12. Flow chart for subroutine INPUTN.

1. Enter
2. K = 0
3. Read N, J, X, Y, NI
4. K = K + NI
5. Form NDF array
6. If N = K, yes; if N > K, no
7. If N > K, call error
8. If N = K, generate nodal data
9. Form NDF array
10. K = K + NI
11. If K < N, yes; if K > N, no
12. If K < N, convert NDF array to eqn. numbers
13. Read material properties of each material group
14. Return
FIG.A.1.3 FLOW CHART FOR SUBROUTINE LIBRY

ENTER

I=0

I=I+1

IS IND = 1?

YES

NO

READ L TYPE NSHAPE
LUB(LTYPE,J) J=1 NSHAPE

LT(I)=LTYPE

IF LT(I)=1 CALL THREDT

IF LT(I)=2 CALL THRED B

IF LT(I)=3 CALL PLANE

IF LT(I)=4 CALL THREDS

IF LT(I)=5 CALL PLATE

IF LT(I)=6 CALL SHELL

IF LT(I)=7 CALL BOUND

IS I = NET?

YES

RETURN
FIG.A1.4 FLOW CHART FOR SUBROUTINE THREDT
FIG.A1.5. FLOW CHART FOR SUBROUTINE TRUSS I

ENTER

IS IND = 1?

YES

NO

2

YES

IS IND = 2?

NO

3

READ NUMBER OF ELEMENTS

READ ELEMENT NUMBER, MATERIAL GROUP
NODE CONNECTIVITY, SECTIONAL AREA, LOAD

FORM ND EQUATION NUMBERS
FOR THE ELEMENT D.O.F

WRITE ND, COORDINATES, MATERIAL GROUP,
LNC AND LOAD ON TAPE (NDARAY),
SECTIONAL AREA

CALL CLMHIT

ARE ALL ELEMENTS PROCESSED?

NO

YES

RETURN
FIG.A1.5. Contd.FLOW CHART FOR SUBROUTINE TRUSS1
3

READ ND AND LNC FROM TAPE (NDAAY)

READ (CB) MATRIX FROM TAPE (ISTRES)

NO

IS THE D.O.F ACTIVE?

YES

COMPUTE THE STRESSES

COMPUTE MEMBER FORCES

ARE ALL D.O.F OF THE ELEMENT CONSIDERED?

NO

YES

PRINT THE MEMBER FORCES

ARE ALL ELEMENT PROCESSED?

NO

YES

RETURN

FIG.A15. Contd. FLOW CHART FOR SUBROUTINE TRUSS1
FIG.A16. FLOW CHART FOR SUBROUTINE CLMHIT

1. Enter

2. Set LS = the smallest eqn. no. of all the d.o.f of the element

3. I = 0

4. I = I + 1

5. Set II = eqn. no. corresponding to the d.o.f (I)

6. Is the d.o.f active?
   - Yes, ME = II - LS
   - No, Is ME > CHT (II)?
     - Yes, CHT(II) = ME
     - No, Is I = NED?
       - Yes, STOP
       - No, Go back to step 5
FIG. A1.7. FLOW CHART FOR SUBROUTINE DIAGNL
FIG.A1.8 FLOW CHART FOR SUBROUTINE ASMBLE
FIG.A1.9 FLOW CHART FOR SUBROUTINE LODVEC

ENTER

READ NUMBER NODES AND LOADED NODES

II = NOF(1, NODE)

IS THE NODAL D.O.F ACTIVE?

NO

YES

P(II) = P(II) + CNL(I)

RETURN

FIG.A1.9 FLOW CHART FOR SUBROUTINE LODVEC
FIG.A1.10 FLOW CHART FOR SUBROUTINE SOLVEC

- ENTER
  - KTR=1
    - NO
    - YES
      - TRI DIAGONALISATION OF STIFFNESS MATRIX
        - CALL LODVEC
          - REDUCE R.H.S LOAD VECTOR
            - BACK SUBSTITUTION
              - RETURN
FIG.A11. FLOW CHART FOR SUBROUTINE DISP

ENTER

INITIALIZE DISP(I)

KK = NDF(I,J)

KK > 0

YES

CALCULATE DISPLACEMENT IN THREE DIRECTIONS FOR EACH NODE

RETURN

NO