NOTATIONS AND ABBREVIATIONS

The use of following notations and abbreviations have been made in the present work.

DJACB : Determinant of the Jacobian Matrix sampled at any point within the element
EQRHS : The right hand side load term after reduction used in FRONT
ETASP : \( \eta \) coordinate of a sampling point, usually a Gauss point
EXISP : \( \xi \) coordinate of a sampling point, usually a Gauss point
NGASP : Number of Gauss points
LNODE : Node currently under consideration
NTOTV : Total number of structural variables
\( = \) NPOIN * NDOFN
NDIME : Number of coordinate components required to define each nodal point
NDOFN : The number of degrees of freedom per nodal point
NELEM : Total number of elements in the structure
NEVAB : Number of variables per element
NGAST : Total number of Gauss Points in a finite element mesh
NGAUS : Number of Gauss Rule adopted
NIKNO : Nickname number for a particular variable used in FRONT
NNODE : Number of nodes per element
NPOIN : Total number of nodal points in the structure
NSTRE : Number of stress components at any point
NVFIX : Total number of boundary points i.e. nodal points at which one or more degrees of freedom are restrained
PIVOT : The diagonal pivoting term used in FRONT
TH : Thickness of laminated composite plate
NUMEL : Element Number
IPLRD : Applied nodal load control parameter
UDLOD : Value of u.d.l. on an element
IELVA,KELVA : Index and counter over the number of eliminated variables
NFRON,MFRON : Number and Maximum frontwidth
ARRAYS USED IN COMPUTER PROGRAM

ASDIS (MSVAB) : Vector of nodal displacements calculated
BMATX (NSTRE, NEVAB) : The element strain matrix at any point within the element
CARTD (NDIME, NNODE) : Cartesian shape function derivatives associated with nodes of current element, i.e. \( \frac{\partial N_1}{\partial x}, \frac{\partial N_1}{\partial y}, \frac{\partial N_2}{\partial x}, \frac{\partial N_2}{\partial y}, \ldots \)
COORD (NPOIN, NDIME) : Coordinates of nodal points
DBMAT (NSTRE, NEVAB) : The result of the matrix multiplication \( DB \)
DERIV (NDIME, NNODE) : Shape function derivatives associated with nodes of the current element
DMATX (NSTRE, NSTRE) : The matrix of elastic constants or rigidities \( D \)
ELCOD (NDIME, NNODE) : Local array of nodal Cartesian coordinates for the element currently under consideration
ELDIS (NDOFN, NNODE) : Nodal displacements associated with a particular element
ELOAD (NELEM, NEVAB) : Nodal forces for each element
EQUAT (IFRON) : The array in which the reduced equations are stored
ESTIF (NEVAB, NEVAB) : The element stiffness matrix
FIXED (IPOSN) : Prescribed displacement values transferred from PRESC array in FRONT
GPCOD (NDIME, NGASP) : Local array of Cartesian coordinates of Gauss Points for element currently under consideration
GSTIF (ISTIF) : Global stiffness matrix
IFFIX (IPOSN) : Fixhy integers transferred from IFPRE array in FRONT. Index IPOSN determines the position of a particular nodal degrees of freedom in the vector
IFPRE (IVFIX, IDOFN) : Integer code to specify which degrees of freedom at a node are to be restrained or prescribed with specified displacement values
LNODS (NELEM, NNODE) : Element node numbers listed for each element
LOCEL (IEVAB) : The vector which locates the global position of each element variable
NACVA (IFRON) : Vector of active variables
NDEST (IEVAB) : Destination vector used in FRONT
NOFIX (IVFIX) : Signifies that IVFIX th boundary node to be specified has a nodal point number
POINT (IDOFN) : Applied nodal point forces
POSGP (NGAUS) : \( \xi, \eta \) coordinates of Gauss Points
PRESC (IVFIX, IDOFN) : Prescribed value of IDOFN th degree of freedom of the IVFIX th boundary node
SHAPE (NNODE) : Shape functions associated with each node of the current element sampled at any point \( (\xi, \eta) \) within the element
SMATX (NSTRE, NEVAB, NGASP) : Contains DBMAT for each Gauss Point - element stress matrix

STRSG (NSTRE) : Stress-resultants at Gauss Point \((\xi, \eta)\) for current element

VECRV (IFRON) : The vector of running variables in which the solved displacements are stored in FRONT

WEIGP (NGAUS) : Weighting functions for Gauss Points

XJACM (NDIME, NDIME) : Jacobian matrix at sampling point

XJACI (NDIME, NDIME) : Inverse of Jacobian matrix at sampling point

GLOAD (IFRON) : The global load vector

NFUNC (IJ) : A function to compute the position \(N\) of element \(I,J\) of a square symmetric matrix whose triangular half is stored as a vector