Appendix 2.

1. Oran C (1973) Tangent Stiffness in Space Structures. Journal of Structural Division, ASCE 99(ST6): 987-1001.
2. Kassimali A, Abbasnia R (1991) Large Deformation Analysis of Elastic space Frames. Journal of structural Engineering, ASCE 117(7): 2069-2087.
3. Oran C (1973) Tangent Stiffness in Plane Frames. Journal of the Structural Division ASCE 99(6): 973-985.
4. Chen WF, Lui EM (1987) Structural Stability, theory and implementation. Elsevier Science Publishing Co., Inc., New York, USA.
5. Weaver W, Gere J (1990) Matrix Analysis of Framed Structures. 2nd (edn) Van Nostrand Inc., New York, USA.
6. Al Abbasi, QM (2000) Large Displacement Elastic Stability Analysis of Plane and Space Structures under Static and Dynamic Loads, M.Sc. thesis, University of Technology, Baghdad, Iraq.
7. Paz M (1980) Structural dynamics theory and computations. Van Nostrand Reinhold Co., USA.
8. Weaver W, Johnston PR (1987) Structural Dynamic by Finite Elements. Prentice-Hill, Inc., USA,
9. Newmark NM (1959) A method of Computation for Structural Dynamics. Journal of Engineering Mechanics Division, ASCE 85(3): 67-94.
10. Subbaraj K, Donkainish MA (1989) A Survey of Direct-integration Methods in Computational Structural Dynamics-II. Implicit Methods. International Journal of Computers and Structures 32(6): 1387-1401.
11. Remseth SN (1979) Nonlinear Static and Dynamic Analysis of Framed Structures. International Journal of Computers and Structures 10: 879-897.
12. Kassimali A, Bidhendi E (1988) Stability of Trusses under dynamic loads. International Journal of Computers and Structures 29(3): 381-392.
13. Bathe KJ (1982) Finite Element Procedures In Engineering Analysis. 2nd (edn) Prentice-Hall, Inc., Englewood Cliffs, New Jersey, USA.
14. Chen WF, Lui EM (1987) Structural Stability, theory and implementation. Elsevier Science Publishing Co., Inc., New York, USA.
15. Dokainish MA, Subbaraj K (1989) A Survey of Direct Time-Integration Methods in Computational Structural Dynamics-Explicit Methods, International Journal of Computers and Structures 32(6): 353-368.
16. Horne NR, Merchant M (1985) The Stability of Frames. 1st (edn), Pergamon Press Ltd., London.
17. Kassimali A (1983) Large Deformation Analysis of Elastic-Plastic Frames. Journal of Structural Engineering ASCE 109(8): 1869-1886.

Appendix 3: Notation

A: Cross-sectional area.

$b_{1n,2n}$: Bowing functions with respect to the n-axis

C_{1n} : Flexural stiffness factors with respect to the n-axis.

C_{2n} : Flexural moment carry over factor with respect top the n-axis.

C_{bn} : Length correction factors due to bowing.

$C_{x,}C_{y,}C_{z}$: Member direction cosines

C_{w} : Warping constant.

C_{t} : Torsional factor.

E : Modulus of elasticity.

$G_{1n,}G_{2n,}H$: Nonlinear geomtric functions with respect to the n-axis.

GJ : Torsional rigidity.

I : Moment of inertia.

L : Initial (undeformed) member chord length.

$L_{c_{ic}}$: Chord length of the deformed member configuration.

M_{1n}, M_{2n} : Bending moments at end (1) and (2) respectively with respect to the n-axis of a beam - column element.

Q : Member axial force.

Q_E : Euler buckling load for a pin- ended column.

q : Axial force parameter, $q = Q / Q_E$

$r_\circ$: Polar radius of gyration.

tol : Tolerance.

u : Relative axial displacement due to the axial force

X, Y, Z : Initial joint cartisian (global) coordinates

x, y, z : Initial joint local coordinates

α : Angle between local and global x-axis

γ, β : For dynamic analysis are parameters determine the accuracy and stability of Newmark method.

: For staic analysis are the angle between the local ,global axis and the projection of the local axis on the X-Z plane.

θ_{1n}, θ_{2n} : Relative rotations of end (1) and (2) of a beam column element

Δ : Increment

α_1, α_2 : Damping parameters related with the natural frequency and damping ratio

m : Mass per unit length

ϕ : Angle between the local and global z-axis

ϕ_t : Angle of twest

$\psi_i(x), \psi_j(x)$: Are the shape functions of the nodal deformations of the beam elements $\varepsilon_n = \frac{I_n}{I}$

$[C]$: Damping matrix

$[M]$: Mass matrix

$[R]$: Orthogonal transformation matrix

$[R_\circ]$: Initial transformation matrix

$[r]$: Current member orientation matrix.

$[r_\circ]$: Initial member oreintation matrix.

$[T]$: Member tangent stiffness matrix in local coordinates

$[T]$: Member tangent stiffness matrix in global coordinates

$[t]$: Member tangent stiffness matrix in Eulerian coordinates

$\{F\}$: Vector of member end forces in global coordinates.

$\{\overline{F}\}$: Vector of member end forces in local coordinates.

$\{S\}$: Vector of member end forces in Eulerian coordinates.

$\{U\}$: Vector of member end displacements in Eulerian coordinates.

$\{V\}$: Vector of member end displacements in global coordinates.

$\{\overline{V}\}$: Vector of member end displacements in local coordinates.

$\{f\}_i$: Vector of the internal forces.

$\{x\}, \{x'\}, \{x''\}$: Displacement, velocity and acceleration vectors.