



## BUCKLING ANALYSIS OF STIFFENED FRAMES

Author(s): **Abdolrasoul Ranjbaran**<sup>1</sup>

Volume: **XII**

No: **1**

Pages: **29-41**

Date: **January 2015**

### **Abstract:**

Stiffeners are used to reduce the probability of local failures in structures. Local stiffening is a matter of interest in aerospace, civil, and mechanical engineering. In spite of the presence of local stiffeners in different structures, the analysis of stiffened frames is scarce in the literature. The effect of local stiffeners on the stability of frame structures is investigated in this paper using detailed modelling of columns. A stiffener reduces the flexibility of a stiffened column. It is a common practice to model a stiffened column by a system of springs in series. This system is not suitable for simulating stiffness in finite element models. Consequently, this has been replaced by an equivalent parallel spring system. The parallel system is used in studying the effects of stiffener on the stability of a structural frame. The exact formulation for simple system is mapped onto the real structure and the exact finite element formulation is derived. The effect of stiffeners on the stability analysis of structural frames is considered and the governing equations are derived. For simple members, a closed form solution and, for stiffened structural frames, the finite element formulation have been proposed. The formulation is implemented in a computer program. The accuracy, efficiency, and robustness of the presented formulation work are verified using case studies.

### **For full paper, contact:**

**Prof Muhammad Masood Rafi**

Editor-in-Chief, NED University Journal of Research

Ph: +92 (21) 99261261-8 Ext: 2413; Fax: +92 (21) 99261255

Email: [NED-Journal@neduet.edu.pk](mailto:NED-Journal@neduet.edu.pk)

Website: <http://www.neduet.edu.pk/NED-Journal>

---

<sup>1</sup> Associate Professor, Department of Civil Engineering and Environmental, Shiraz University, Iran, Ph. +989173145501, Fax: +98711647316, Email: Ranjarn@Shirazu.ac.ir.