Optimization of plane frames with variable cross-section

Pham Van Trung 1, Tran Thi Thuy Van 1,\*

*1* *Faculty of Civil Engineering, Hanoi Architectural University, Vietnam*

*\*Corresponding author: vanttt@hau.edu.vn*

**Abstract.** The article presents applying the Gradient method in the optimization of the plane frames with constant and variable cross-sections based on the force and displacement methods. The authors established the relationship between internal forces and displacements of the element end with different boundary conditions. The calculation procedure is written in the programming software MATLAB. The obtained results are compared with the results of other methods to verify the applied method's accuracy, reliability and effectiveness.

**Keywords:** Optimization, Gradient method, Variable cross-section, Plane frame.