

NUMERICAL APPROACHES FOR BEAMS ON NONLINEAR FOUNDATION - PART 2 (APPLICATIONS)

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Abstract: This work presents numerical approaches and applications for the solutions of straight plane beams rested on elastic foundations. There are linear/nonlinear modified bilateral and unilateral Winkler's models (i.e. suitable approximations for dependencies of distributed reaction forces on deflection in the foundation). At first, for solutions of bilateral foundation, the Central Difference Method is applied in combination with the Newton's Method. At second, for solutions of unilateral foundation, the Finite Element Method is applied in combination with the Semi-Smooth Newton's method. The results acquired by linear/nonlinear approaches are evaluated and compared.

Keywords: unilateral and bilateral elastic foundation, nonlinear foundation, beam, Finite Element Method, Semi-Smooth Newton's method, Central Difference Method.