

Application of the theory of compound cores for the assessment of stress pattern in the cross section of a strengthened beam column

Fardiev R., Sabitov L., Kashapov N., Gilmanshin I.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. The article considers the results of theoretical studies of the stress-strain state of an eccentrically compressed element reinforced with a reinforced concrete cage. The theory of composite rods is used as a theoretical basis. As a result of the solution of the theoretical problem, analytical expressions are obtained for determining the normal stresses in the cross-section of the reinforced element and tangential stresses along the contact seam. The results of the calculations for the proposed approach are compared with the previously performed research results.

<http://dx.doi.org/10.1088/1757-899X/412/1/012011>

References

- [1] Babich V I and Kochkarev D V 2004 Calculation of reinforced concrete structures by deformation Concrete and reinforced concrete 12-16
- [2] Zalesov A S, Chistyakov E A and Laricheva I Y 1997 New methods of normal section calculation on the basis of a deformation design model Concrete and reinforced concrete 31-34
- [3] Rzhaniysyn A R 1986 Compound bars and plates (M.: Stroiizdat) 316
- [4] Fardiev R F, Kayumov R A and Mustafin I I 2011 Calculation of a beam column strengthened by a reinforced concrete collar with allowance for previous load history and nonlinear properties of concrete Izvesiya KGASU 109-114
- [5] Fardiev R F and Mustafin A I 2012 The study on the reinforced concrete beam columns strengthened by a collar with allowance for stress state before strengthening Integration, partnership and innovation in construction science and education 152-57
- [6] Valeev G S and Fatkhullin V S 1994 Application of prefabricated reinforced concrete in reconstruction of buildings and structures (News of Higher Educational Institutions. Construction) 114-17
- [7] Grozdov V T and Sergeev S L 1996 The question of allowance for strength of the contact zone under the calculation of reinforced concrete bending structures strengthened by the extension of cross sections (News of Higher Educational Institutions. Construction No 4) 34-38
- [8] Sungatullin Y G 1975 Experimental and theoretical basis of the calculation of shear resistance of reinforced and non-reinforced contacts of cast-in-place and precast structures Cast-in-place and precast structures: collection of research papers 90-146