

THE TORSIONAL AND SHEAR BEHAVIOR OF STEEL FIBER REINFORCED RC MEMBERS

Abdulkadir Cüneyt AYDIN ^{a*}, Mahmut KILIÇ ^b, Mahyar MAALI ^c, Barış BAYRAK ^d, Erkan TUNÇ ^e

^a Prof.; Ataturk University, Engineering Faculty, Department of Civil Engineering, 25030, Erzurum, Turkey

* Corresponding author. E-mail address: *acaydin@atauni.edu.tr*

^b Assistant Prof.; Ataturk University, Engineering Faculty, Department of Civil Engineering, 25030, Erzurum, Turkey
E-mail address: *mahmut.kilic@atauni.edu.tr*

^c Associate Prof.; Erzurum Technical University, Engineering and Architecture Faculty, Department of Civil Engineering, Erzurum, Turkey
E-mail address: *mahyar.maali@erzurum.edu.tr*

^d PhD; Ataturk University, Engineering Faculty, Department of Civil Engineering, 25030, Erzurum, Turkey
E-mail address: *baris.bayrak@atauni.edu.tr*

^e MSc; Ataturk University, Engineering Faculty, Department of Civil Engineering, 25030, Erzurum, Turkey
E-mail address: *rkntnc.06@gmail.com*

Received: 29.09.2020; Revised: 29.03.2021; Accepted: 01.05.2021

Abstract

Beams and columns are one of the important structural elements of buildings to take up transverse loads such as axial load, bending moment, shear, and torsion. Present work is an experimental investigation on the shear, torsion, and axial load behavior of the structural members like columns and/or beams. The reinforced concrete members with 0, 30, and 60 kg/m³ of steel fibers were tested for torsion, shear and axial loading for this study. The twist angle, the load-deflection behavior, the ultimate shear strength, the torsional moment, and the critical moments were obtained for the loading type and steel fiber ratios. The results show that the increasing steel fiber ratio, increased the torsional moment capacity and decreased the shear strength capacity. On the other hand, increasing the steel fiber content increased the both axial load and moment capacity of RC columns. The shear strength and the torsional moment capacities are defined by the provision of current codes of practice such as ACI318-19, Eurocode-2, British, Australian and Turkish Standards.

Keywords: Behavior; Interaction; Reinforced concrete; Shear; Steel fiber reinforcement; Torsion.