

# Seismic performance of a full-scale FRP retrofitted sub-standard RC building

Alper Ilki<sup>1</sup>, Erkan Tore<sup>2</sup>, Cem Demir<sup>1</sup>, Mustafa Comert<sup>3</sup>

<sup>1</sup> Istanbul Technical University, Faculty of Civil Engineering, Istanbul, Turkey

<sup>2</sup> Balikesir University, Department of Civil Engineering, Balikesir, Turkey

<sup>3</sup> RISE Engineering and Consultancy, Istanbul, Turkey

**Abstract** External jacketing of columns with Fiber Reinforced Polymers (FRPs) is a promising retrofitting technique for improving seismic performance of sub-standard reinforced concrete (RC) buildings. The enhancement in deformation capacity and shear strength of jacketed members helps to prevent the brittle collapse mechanism of buildings with inadequate ductility. This paper provides an overview on the retrofitting of columns with FRP jacketing for particularly ductility enhancement and gives a brief summary of seismic strengthening recommendations of various design documents. In addition, a recent full-scale test conducted simultaneously on an as-built and a FRP retrofitted building, which are identical with design geometry, material quality and seismic deficiencies, is briefly presented and the performance of the retrofitting technique is evaluated. Finally, analytical behavior obtained through nonlinear static analyses executed using FRP-confined concrete models recommended in different technical documents are reviewed in comparison with the experimental behavior.