

# Accepted Manuscript

Shear strengthening of full-scale RC T-beams using textile-reinforced mortar and textile-based anchors

Zoi C. Tetta, Lampros N. Koutas, Dionysios A. Bournas



PII: S1359-8368(16)30164-0

DOI: [10.1016/j.compositesb.2016.03.076](https://doi.org/10.1016/j.compositesb.2016.03.076)

Reference: JCOMB 4177

To appear in: *Composites Part B*

Received Date: 19 January 2016

Revised Date: 21 March 2016

Accepted Date: 25 March 2016

Please cite this article as: Tetta ZC, Koutas LN, Bournas DA, Shear strengthening of full-scale RC T-beams using textile-reinforced mortar and textile-based anchors, *Composites Part B* (2016), doi: 10.1016/j.compositesb.2016.03.076.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Shear strengthening of full-scale RC T-beams using textile-reinforced mortar and textile-based anchors

Zoi C. Tetta<sup>a</sup>, Lampros N. Koutas<sup>b</sup>, Dionysios A. Bournas<sup>c\*</sup>

<sup>a</sup> Department of Civil Engineering, University of Nottingham, NG7 2RD, Nottingham, UK

<sup>b</sup> Department of Civil and Structural Engineering, University of Sheffield, Sir Frederick Mappin Building, Mappin Street, Sheffield, S1 3JD

<sup>c</sup> European Laboratory for Structural Assessment, Institute for the Protection and Security of the Citizen, Joint Research Centre, European Commission, T.P. 480, I-21020 Ispra (VA), Italy

\* Corresponding author. Tel.: +39 0332 78 5321. E-mail: [Dionysios.Bournas@jrc.ec.europa.eu](mailto:Dionysios.Bournas@jrc.ec.europa.eu)

## Abstract:

This paper presents a study on the effectiveness of TRM jacketing in shear strengthening of full-scale reinforced concrete (RC) T-beams focusing on the behaviour of a novel end-anchorage system comprising textile-based anchors. The parameters examined in this study include: (a) the use of textile-based anchors as end-anchorage system of TRM U-jackets; (b) the number of TRM layers; (c) the textile properties (material, geometry); and (d) the strengthening system, namely textile-reinforced mortar (TRM) jacketing and fiber-reinforced polymer (FRP) jacketing for the case without anchors. In total, 11 full-scale RC T-beams were constructed and tested as simply supported in three-point bending. The results showed that: (a) The use of textile-based anchors increases dramatically the effectiveness of TRM U-jackets; (b) increasing the number of layers in non-anchored jackets results in an almost proportional increase of the shear capacity, whereas the failure mode is altered; (c) the use of different textile geometries with the same reinforcement ratio in non-anchored jackets result in practically equal capacity increase; (d) TRM jackets can be as effective as FRP jackets in increasing the shear capacity of full-scale RC T-beams. Finally, a simple design model is proposed to calculate the contribution of anchored TRM jackets to the shear capacity of RC T-beams.

**Keywords:** shear strengthening; textile reinforced mortar; TRM; reinforced concrete; T-beams; textile anchors; FRCM; fiber reinforced polymers; FRP.

Download English Version:

<https://daneshyari.com/en/article/7212672>

Download Persian Version:

<https://daneshyari.com/article/7212672>

[Daneshyari.com](https://daneshyari.com)