Influence of prestressed force in the waste tire reinforced concrete

Publons ID	28377006
Wos ID	WOS:000370957800091
Doi	10.1016/j.proeng.2015.11.088
Title	Influence of prestressed force in the waste tire reinforced concrete
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Publish Date	2015
Journal Name	CIVIL ENGINEERING INNOVATION FOR A SUSTAINABLE
Citation	9
Abstract	Amount of waste tires in Indonesia is about 50 million pieces per year in which serious treatments are necessary in the future. This is because their utilizations are still limited and requires further studies to increase their feasible added value. With this regards, this work is aimed to investigate possibilities on using of waste tires as reinforcement material for concrete by experimental and finite element simulation. With concrete as matrix, both of them are implemented in non-prestressed and prestressed waste tire reinforced concrete in standard flexural testing procedures. Two concrete beam specimens with reinforcement and one specimen without reinforcement are used to investigate the flexural capacity. Dimension of the all specimens are 150 mm x 150 mm x 1000 mm. In the prestressed specimens, the waste tire reinforced are tensioned with 0% and 17% of their strain before casting of concrete. After the concrete are hardened, they are then jacked at the end of concrete beam using anchorage clamping. The flexural strength tests are carried out by using three point loading scenario for the beam after 28 days concrete ages. The result shows that prestressed force of waste tires as reinforcement contribute significantly on the flexural strength of the concrete beam over the non-waste tires reinforcement as well as non-prestressed one. Finally, finite element analysis simulating the test is also introduced here to give an initial study on how to model behavior of this type of concrete composite in global responses. (C) 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
Publish Type	Book in series
Publish Year	2015
Page Begin	638
Page End	643
Issn	1877-7058
Eissn	
Url	https://www.webofscience.com/wos/woscc/full-record/WOS:000370957800091
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