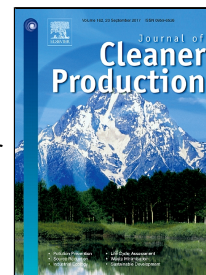


Accepted Manuscript

Texture and Design of Green Chip Seal Pavement Using Recycled Crumb Rubber Aggregate



Ahmed Gheni, Omar I. Abdelkarim, Mohanad Abdulazeez, Mohamed A. ElGawady

PII: S0959-6526(17)31846-2
DOI: 10.1016/j.jclepro.2017.08.127
Reference: JCLP 10386
To appear in: *Journal of Cleaner Production*

Received Date: 26 February 2017
Revised Date: 23 June 2017
Accepted Date: 15 August 2017

Please cite this article as: Ahmed Gheni, Omar I. Abdelkarim, Mohanad Abdulazeez, Mohamed A. ElGawady, Texture and Design of Green Chip Seal Pavement Using Recycled Crumb Rubber Aggregate, *Journal of Cleaner Production* (2017), doi: 10.1016/j.jclepro.2017.08.127

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.

Texture and Design of Green Chip Seal Pavement Using Recycled Crumb Rubber Aggregate

Ahmed Gheni¹; Omar I. Abdelkarim², Ph.D.; Mohanad Abdulazeez³; Mohamed A. ElGawady⁴, Ph.D.

Abstract

The depletion of natural resources forces the construction industry to explore using cleaner recycled material as replacements of virgin construction materials. A new eco-friendly chip seal pavement, in which the mineral aggregate was replaced by crumb rubber obtained from scrap tires, was investigated in this study. A total of 142 chip seal specimens were prepared and tested to investigate the impact of using recycled rubber aggregate on the chip seal's micro and macro texture and their impacts on the skid resistance. The microtexture of the new proposed recycled aggregate was examined using a high-resolution 3D digital microscope. The macrotexture of the new chip seal pavement was examined using image processing and sand patch methods. The skid resistance of the new chip seal under both ambient and elevated temperatures was then explored. Two types of emulsions, two types of asphalt cement binders, two types of mineral aggregate as well as two types of recycled crumb rubber were involved in the examined test matrix. This study concluded that the crumb rubber can be used in the chip seal as partial or full replacement of

¹ Ph.D. Candidate, Dept. of Civil, Architectural, and Environmental Engineering, Missouri University of Science and Technology, Rolla, MO 65409; aagmr6@mst.edu

² Postdoctoral Fellow, Dept. of Civil, Architectural, and Environmental Engineering, Missouri University of Science and Technology, Rolla, MO 65409; Omar.Abdelkarim@mst.edu

³ Ph.D. Candidate, Dept. of Civil, Architectural, and Environmental Engineering, Missouri University of Science and Technology, Rolla, MO 65409; mma548@mst.edu

⁴ Benavides Associate Professor, Dept. of Civil, Architectural, and Environmental Engineering, Missouri University of Science and Technology, Rolla, MO 65409; elgawadym@mst.edu

Download English Version:

<https://daneshyari.com/en/article/5479974>

Download Persian Version:

<https://daneshyari.com/article/5479974>

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