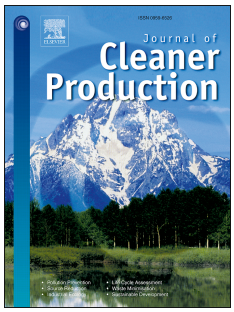
Accepted Manuscript



Utilization of reclaimed asphalt pavement aggregates containing waste from Sugarcane Mill for production of concrete mixes

Surender Singh, G.D. Ransinchung R.N., Solomon Debbarma, Praveen Kumar

PII: S0959-6526(17)32486-1

DOI: 10.1016/j.jclepro.2017.10.179

Reference: JCLP 10971

To appear in: *Journal of Cleaner Production*

Received Date: 14 May 2017

Revised Date: 12 September 2017

Accepted Date: 17 October 2017

Please cite this article as: Singh S, Ransinchung R.N. GD, Debbarma S, Kumar P, Utilization of reclaimed asphalt pavement aggregates containing waste from Sugarcane Mill for production of concrete mixes, *Journal of Cleaner Production* (2017), doi: 10.1016/j.jclepro.2017.10.179.

Utilization of Reclaimed Asphalt Pavement Aggregates Containing Waste from Sugarcane Mill for Production of Concrete Mixes

Surender Singh[a], G.D.Ransinchung R.N.[b*], Solomon Debbarma[c] and Praveen Kumar[d]

[a]Research Scholar, Department of Civil Engineering, IIT Roorkee, India-247667, email- surendr.singh38@gmail.com

[b*]Corresponding Author, Associate Professor, Department of Civil Engineering, IIT Roorkee, India-247667, email- gdranfce@iitr.ac.in Phone No- (O): +91-1332-285584, (R): +91-1332-285136.

[c]Research Scholar, Department of Civil Engineering, IIT Roorkee, India-247667, email- solo.debbarma124@gmail.com

[d]Professor, Department of Civil Engineering, IIT Roorkee, India-247667, email- pkaerfce@iitr.ac.in

Wordcount - 7856

Abstract

The present study investigates the potential of waste originating from road sector (RAP) and agricultural industry (Sugarcane Bagasse Ash) for production of concrete mixes. 5 mixes were prepared by partial replacing natural aggregates by coarse RAP (CRAP) and fine RAP (FRAP) in the proportions of 50% and 100%. 3 subsequent mixes were prepared by incorporating 100% RAP aggregates blended with 10% and 15% Bagasse Ash (BGA) as part replacement of cement. It was noted that incorporations of FRAP aggregates decreased the fresh, mechanical and durability properties of concrete significantly compared to CRAP aggregates. Incorporation of 10% BGA was found to enhance the mechanical and durability properties of 100% RAP concrete significantly. Economic analysis of the considered mixes showed that incorporations of RAP aggregates blended with BGA can reduce the total cost of 1 m^3 concrete by more than 40% as compared to conventional concrete. From the present study, it is recommended to replace 10% of cement by BGA in RAP concrete as this would not only strengthen the pavement but provides with environmental and economic benefits.

Keywords; RAP, Bagasse Ash, Cement, Strength, Pavements