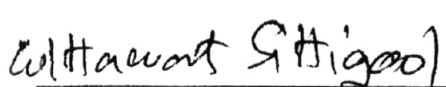


Wittawat Sittigool 2006: A Study of Using Slag From Cast Iron Smelting Process as Hot Bin 1 Aggregate Replacement in Asphalt Concrete Hot Mix. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Watcharin Witayakul, M.Eng. 137 pages. ISBN 974-16-2969-9

The objective of this study is finding the optimal replacement level of cast iron slag, the cast iron industrial byproduct, as hot bin 1 aggregate in asphalt concrete for wearing course pavement.

All testing were done by Marshall Method. Asphalt cement penetration 60/70 was used as binder and limestone, granite or basalt were used as main aggregates Cast iron slag was used for fine aggregate (hot bin 1) replacement. Replacement levels of hot bin 1 aggregate were at 4, 8,12, 16 and 20 percent of total aggregate weight. Marshall testing showed that replacing fine aggregate with cast iron slag at 8 percent of total aggregate weight gave the best result. It increased asphalt concrete stability 47.18 % for limestone, 24.08 % for granite and 38.85 % for basalt. The asphalt concrete density was increased, void filled with bituminous (VFB) and void in the mineral aggregate (VMA) were reduced, flow was in accepted level. The strength index was improved.

Therefore, cast iron slag can be used to replace the fine aggregates efficiently. All the properties were over Marshall wearing course standard. The most advantage of cast iron slag replacement is stability increasing, which be able to reduce pavement rutting possibility. Besides, using the useless cast iron industrial byproduct is the way to improve value of the waste and conserve the environment.



Student's signature

 20, 10, 2006

Thesis Advisor's signature