

DESIGN OF A POROUS CONCRETE MEDIUM FOR PAVEMENT BLOCKS

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ABSTRACT

One of the main issues that the city council officials and planning and regulating authorities face in most of the heavily populated and densely packed cities in all most all the countries in the world is “flash floods” due to intensive rainfalls lasting over a very short duration of time. Flash floods are the most dangerous of its kind because it combines the impact of a destructive flood with a very high level of uncertainty and un-predictability of its occurrence. Two main reasons for this are the high volumes of surface runoffs due to impervious areas and capacity limitations in existing storm water channels and drainage systems in most of the conventional cities. More and more impervious areas will result due to rapid rate of infrastructure developments happening in cities with new buildings, bituminous paved roads, parking slots and paved areas. This can have a very significant impact on the infiltration rate in case of a heavy rain situation.

The study presented here is an attempt to develop a porous concrete medium made out of crushed stone aggregates referred here in as chips (nominal aggregate size is 10 mm) as the coarse aggregate, mixed with different proportions of saw dust. In order to make the medium porous, specimens were then burnt in a temperature controlled environment at 450-500°C for 12 hours. However, as expected, although the medium becomes porous, there is a significant drop in compressive strength of the specimen, since cementitious materials does not perform well subjected to high temperature values. The research findings must be supported with more research in this area to determine the optimum mix proportions, other alternatives for saw dust and more green and low carbon materials and manufacturing processes in future.

Key words: Flash floods, infiltration, porous concrete medium