

AN ABSTRACT OF A THESIS

THE EFFECT OF PERCENT PASSING THE NO. 200 SIEVE (DUST OF FRACTURE) ON PLASTIC AND HARDENED PROPERTIES OF THE MORTAR PORTION OF PCC

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Resources used in PCC, such as natural sands, are slowly being depleted. A fine aggregate termed manufactured sand is being used in place of these natural sands. The draw back from using the manufactured sand is that it produces an excess of minus 200 mesh material. ASTM C 33 limits the amount of minus 200 mesh material that can be used in PCC because of the presence of deleterious materials. Many quarries stockpile the excess of minus 200 material, which is simply a waste. In the industry today, many researchers are trying to find a way to include higher amounts of minus 200 material in PCC without compromising any engineering properties.

A laboratory study was conducted to determine if including higher amounts of minus 200 material is actually harmful to PCC properties. Eleven different mortar mixtures were designed with various amount of microfines content from one percent to seventeen percent. All mixtures were tested for 7 and 28-day compressive strength values as well as determining the percent absorption, density, and water permeable voids. A river sand and Talbot gradation mixture was also included in the eleven as a comparison.

In general, including higher amounts of microfines increases water demand and does not reduce absorption or water permeable void percentages. C-ash and a normal range water reducer did seem to be beneficial in increasing durability measures of PCC. The water-cement ratio was the key factor in the study. Percent absorption and water permeable voids were both influenced greatly by the water-cement ratio.