# INVESTIGATION OF THE USE OF QUARRY DUST AS CONSTRUCTION MATERIAL


**By**

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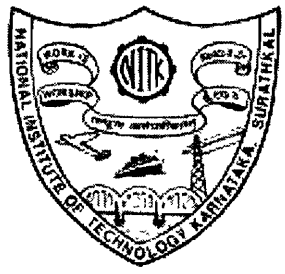


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# ABSTRACT

A significant amount of mine/quarry dust is generated during mining operations. This dust is not put to any use & is dumped either in worked out areas or in spoil dumps creating visual impact. There is a possibility of using this dust as a part of construction material. However, before using it in construction, various strength properties need to be determined. Further what proportion of dust to be mixed for preparation of the construction material, needs to be investigated in detail. An attempt is made in this project to arrive at the best possible combination of mine/quarry dust with cement/sand mixture without sacrificing the strength properties of the construction material.

The basic methodology behind the project was to vary the concentration of the granite dust as a substitute of sand and then test for strength properties for different curing period. For this purpose the mixture was classified into 3 distinct categories namely S, $S_g$ and $S_{gl}$ with mixture containing sand, sand and granite dust and granite and limestone dust respectively. This was to test the strength behaviour of concrete blocks for different concentration of sand and the according mixture of quarry dust. To facilitate this process more effectively, each class of mixture was divided into 5 subclasses by making the mixture leaner by increasing sand or quarry dust for a given quantity of cement. These mixtures were further divided into 2 groups, one being tested for 7 days curing while the other being tested for 28 days curing. These samples were allowed to set for 24 hours before putting for water curing and were air cured for 3 days after water curing. To add to the result for each proportion one extra sample was manufactured to calculate the water absorption behaviour of the sample for given proportion. The major part of the project was to manufacture totally 105 samples and test 90 of these for strength

characteristics and 15 for water absorption characteristics. The samples were tested for compressive strength in the universal testing machine. The results were tabulated in form of tables and comparison between various samples was done in the form of line graphs and bar graphs.

The results and outcomes in this dissertation are discussed individually for a given set of graphs and group of mixtures. The comparison of the concrete blocks is also accompanied with discussion on potential uses of bricks made of quarry dust and the possible revenue generated after being compared with the standard market rates.