

VISVESWARAIAH TECHNOLOGICAL UNIVERSITY
BELGAUM-590014, KARNATAKA



A PROJECT REPORT ON

“SUSTAINABLE AND COST EFFECTIVE BUILDING MATERIAL TECHNOLOGY THROUGH PARTIAL REPLACEMENT OF CEMENT BY GRANITE CUTTING SLURRY WASTE POWDER AND PARTIAL REPLACEMENT OF COARSE AGGREGATES BY MANGALORE TILE BATS FOR ARCH LINTELS”

**(Approved by Karnataka State Council for Science and Technology,
Indian Institute of Science, Bangalore)**

**Submitted in partial fulfillment of the requirements for the award of degree
Of BACHELOR OF ENGINEERING in CIVIL ENGINEERING.**

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SYNOPSIS

Introduction:

The Arch lintels are the structural members, which are used to bridge the openings in buildings, bridges & to transfer the loads above the openings to the piers or abutments. An Arch supports the superimposed load by an Arch action where as the lintels acts like a beam and transfers the load vertically to the supporting walls. Though the Arch lintels are widely used these days, it has some drawbacks in connection with the materials used and workmanship. In stone Arch masonry it is difficult to obtain stone blocks of required length without flaws. Brick arch masonry show many cracks where as steel arch sections are not economically viable and develops cracks in the superimposed masonry structure due to expansion of the steel during change in temperature.

Engineering judgment and judicious use of available materials can reduce the cost of housing. Efforts are needed in this regard to bring about economy in housing cost and also proper utilization of limited resources. Therefore, it is essential that every possible step should be taken to find substitute material for this due to some of this reason arch lintels are constructed using pre cast concrete wedge shaped bricks. The concrete brick are not regular cement concrete bricks they are manufactured with partial replacement of cement by Granite cutting slurry waste powder (fine slurry powder) and coarse aggregate by Mangalore tile bats. Hence this proposed cost effective cement concrete(Tilecrete) brick will hide waste material and avoid environmental hazards at the same less consumption of regular cement concrete ingredients such as Fine aggregate & cement. Hence this will prove that proposed cement concrete (Tilecrete) bricks are environment friendly and cost effective.

Concrete is the most widely used construction material in India and abroad with annual consumption exceeding 100 million cubic meters.

It is cost effective and relatively environment friendly construction material .Now a days use of pre-cast concrete proves to be advantageous when there are many identical members to be cast , because the same forms can be used many times. It is also helpful in saving the cost of forms.

The growing need of building for building materials has resulted in innovation in building material. The costs of building material constitute about 60% to 65% of the total cost of building and as every possible attempts should be made to economize on the cost of material to be used in the structure.

Hence an attempt is made to find the load carrying capacity of arch Lintels constructed using pre-cast bricks of cement concrete(Tilecrete).

In recent years , innovative construction technique and improved building material, which ever evolved as product of basic and applied research, where tried out under field conditions in prototype experimental for their technical and economical evaluation successful techniques are subsequently propagated for wider adoption.

Currently the arch lintels are constructed both in commercial and residential buildings. Main objective of the arch is to transfer super imposed load of the structure to the ground by providing unobstructed passage. It should be economical. It should be durable and should have heavy load carrying capacity.

In this project work it is proposed to construct arch lintels using cost effective pre cast wedge shaped concrete bricks made by partial replacement of Cement by Granite cutting slurry waste powder and coarse aggregate by Mangalore tile bats and then these are subjected to uniformly distributed load.