

A STUDY ON CONCRETE DISCONTINUITY

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ABSTRACT

Usefulness of concrete is known to every body, as it has very vast scope in the modern society. We use concrete starting from the foundations to dome of high rise buildings, from drains to canals and aqueducts, from drain covers to big-big bridges joining main lands with islands, from canal linings to harbour structures and other huge water front structures. However, when ever a structure, be small or large, is erected it takes time. Most of the prominent structures are erected in stages. There are always joints between the two consecutive stages. These joints are bound to have some effect on the strength of the structure depending on the time gap between two stages, preparation of joints, inclination of joints, roughness of joints, and so on. This fact should be given proper attention and systematic investigation should be carried out. Keeping in view, the proposed basic research program has been planned. It is proposed to study the effects of joints on the strength of concrete in the following manner:

- i) To study effect of joints on the strength of concrete.
- ii) To study the affect of inclination of construction joints on the strength of concrete.

The compressive cube test is conducted to get the value of compressive strength of concrete cubes with joints and without joints. A comparison of both is made and conclusion is reported.

CHAPTER 1

INTRODUCTION

1.1 General

Concrete can be defined as the mixture that results from blending hydraulic portland cement (or blended cement), sand, stone and water. On its early usage, concrete is an unusual material as it is an artificial composite, using raw materials and then rebuilding them into rocklike forms imitating structures known as *conglomerates*. These are particle composites of stones and other material embedded in a matrix of silt and sand that has hardened over time into a sedimentary stone. However, the resulting material of concrete is artificial and complex due to the chemistry of cements.

The primary components that control the strength of concrete are the water and the cement contents. These two components are commonly referred to as the water/cement ratio. The water/cement ratio has the greatest effect on the strength of the mix. While properly graded sand and stone, and their relative amounts can affect the overall strength of the mix.

Cement, or commonly referred to as hydraulic portland cement, is the paste that holds the sand and stone together in concrete, when water is added to the cement mixture. Addition of water initiates the chemical reaction of *hydration* or absorption of water, and the resulting material resembles a mineral form known as *tobermite*. Every particle is wrapped in cement and connected to adjacent particles by cement bridges. This mass of solid