PRODUCTION OF 'STRENGTH CURVES' FOR LIMESTONE AGGREGATES (diabase)

PROJECT REPORT SUBMITTED BY:
TSAGGARY EMILY 3CE2
&
PANAYIOTOU PANAYIOTIS 3CE2

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Introduction

Concrete either reinforced or plain is the most widely used construction material. Judging from world trends, the future of concrete looks even brighter because for most purposes it offers suitable engineering properties at low cost, combined with energy-saving and ecological benefits. It is therefore desirable that engineers know more about other building materials.

In spite of concrete's apparent simplicity, it has a highly complex structure; therefore, the structure-property relations that are generally so helpful in the understanding and control of material properties cannot be easily applied. Concrete contains a heterogeneous distribution of many solid components as well as pores of varying shapes and sizes which may be completely or partially filled with alkaline solutions.

Compared to other materials, the structure of concrete is not a static property of the material. This is because two of the three distinctly different components of the structure, the bulk cement paste and the transition zone because the aggregate and the bulk cement paste-continue to change with time. In this respect, concrete resembles with wood and other living systems. Strength and some other properties of concrete depend on the cement hydration products, which continue to form for several years. Although the products are relatively insoluble, they can slowly dissolve and recrystalline in moist environments, thus imparting to concrete the ability to heal microcracks.

Generally there are two overall criteria for good concrete. Concrete must be satisfactorily in its hardened state and also in its fresh state while being transported from the mixer and placed in the formwork. The requirements in the fresh state are that the consistence of the mix be such that it can be compacted by the means desired without excessive effort, and also that he mix be cohesive enough for the method of placing used not to produce segregation with a consequent lack of homogeneity of the finished product.

The usual primary requirement of a good concrete in its hardened state is a satisfactory compressive strength. This is aimed at not only so as to ensure that the

concrete can withstand the prescribed compressive stress but also because many other desired properties of concrete are related with high strength.

The objective of this particular project was to produce 'strength curves' for limestone aggregates. There are many factors that effect the strength of the concrete mix; each of them is discussed separately in the second part of the project. The main factor that effects the strength of the concrete mix is the water to cement ratio. To see the effect of the water to cement ratio we prepared seven mixes of different ratios and we produced a graph indicating the results. From the graph we can clearly see the relation of the strength with W/C and compare each other. The tables and the graph are attached in the experimental part of the project.

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