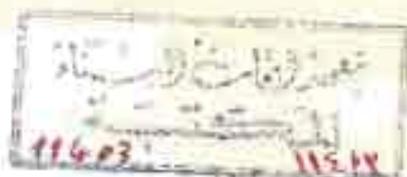


1970 سبتمبر 19



**CONCRETE MIXES USING AGGREGATES FROM  
NATURAL SOURCES IN EGYPT**

*By*

**Dr. A. A. SABER**

*Building Research Institute*

المركز القومي لبحوث الإسكان والبناء  
Housing & Building National Research Center

Since 1954

D.

28 A 21

↓

D.

1 A 21

أ. السعيد

13 سبتمبر 1970  
مركز البحوث  
البناء  
11403 11304

# CONCRETE MIXES USING AGGREGATES FROM NATURAL SOURCES IN EGYPT

By

Dr. A. A. SABER

*Building Research Institute*

Due to the fact that concrete in Egypt constitutes 25 to 40% of the total cost of dwellings and public buildings, and a still higher percentage for some other structures such as reinforced concrete bridges and tanks, the Building Research Center has prepared a vast programme for the study of concrete comprising the following applied researches:

1. Applied research on concrete mixes containing silicious aggregates (Pyramid sand and gravel).
2. Applied research on concrete mixes containing a mixture of silicious and calcareous aggregates. (Calcareous gravel from El-tibbeen, Helwan with silicious pyramid sand.)
3. Applied research on concrete mixes containing all-in calcareous aggregates (crushed limestone from Mariout and Alam el-Markah Quarries. — Alexandria).

The drive for conducting the first research was that Cairo, on its own consumes about 40% of the amount of concrete used in Egypt. This concrete depends on quarries near Cairo mainly. Pyramid Sand and gravel quarries as a source of silicious aggregates (Fig. 1).

The drive for conducting the second research was the extension of habitation towards areas rich in calcareous gravel such as the Helwan district (Fig. 2).

The drive for conducting the third research was that the Alexandria area still receives its supply of silicious aggregates from distant areas which resulted in increasing the price of silicious aggregate tremendously. On the average the price in Alexandria is double the price in Cairo inspite of the presence of unused limestone in the vicinity of Alexandria. (Fig. 3).

The above researches comprise a study of the physical, mechanical and chemical properties for the aforementioned kinds of aggregates and the properties of fresh and hardened concrete containing these aggregates with ordinary Portland Cement.

## PROPERTIES OF THE AGGREGATES

### *Physical and Mechanical Properties of the Aggregates:-*

Tests were performed on samples from all batches of aggregates used in these researches according to the Code of Practice for concrete aggregates from natural sources. The average results of these tests are given in Table I.