

# **Studying the effects of masonry Mel powder (limestone powder with a high percentage of calcium carbonate) on the mechanical properties of high strength lightweight structural concrete using expanded light particle perlite**

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## **Abstract:**

*Due to increased pollution problems of cement factories and its adverse impact on the environment and the high global price of this strategic material that increases the final cost of concrete, there are always a lot of efforts to achieve high strength lightweight structural concrete using indigenous and inexpensive materials that are replaced by part of the environmentally friendly cement in order to achieve sustainable development. Therefore, 204 cylindrical concrete samples were considered in 30\*15 sizes with 34 mix designs, including concretes containing Mel powder (limestone powder with a high percentage of calcium carbonate) with different mix percentages. Results of this study that are obtained by implementing tests on samples made on 7 days, 28 days and 90 days demonstrated that using masonry Mel powder as 17 percent of cement weight, decrease weight of concrete and increase compressive and tensile strength of concrete using micro silica by 50 percent and increase by 30 percent in the absence of micro silica.*

## **1. Introduction**

Masonry Mel powder consists of limestone powder and high percentage of calcium carbonate that is prepared industrially for certain building works. The use of these materials is regarded as very useful for their availability and their abundance in the mines of Iran, because they cheapen the cost of concrete and improve the mechanical properties of the concrete [1]. In recent decades much research has been conducted on concrete properties containing limestone powder such as compressive strength, setting time, slump, and viscosity [2-3] and significantly improves several cement properties such as compressive strength, water demand, workability, durability [8-14] and can also decrease production costs. There has been research on high-strength concrete using this powder [1, 4], there has been also another research on effect of Pozzolanic materials on durability and permeability of concrete against