

## بيانات عن بحث (5) مقدم للترقية

### **Partial Replacement of Sand in Concrete with Available Natural Pozzolan in KSA**

This paper presents an experimental investigation on the effect of the partial replacement of fine aggregates in concrete with available local natural pozzolan (NP) in Al-Madinah Al-Munawarah, Kingdom of Saudi Arabia (KSA). The utilization of NP has reduced the density of concrete and improved its mechanical properties. The Saudi Building Code has recommended using pozzolan with a special type of cement in the case of concrete exposed to high percentages of sulfate. 48 concrete cylinders with dimensions of 150x300 mm have been prepared. The cylinders have been divided into two groups according to the level of cement replacement with silica fume (SF). The first group consists of 24 concrete cylinders with natural sand (NS) substitution with NP by volume at replacement levels of 20%, 50% and 100% without SF. The second group consists of 24 concrete cylinders with sand substitution with NP by volume at replacement levels of 20%, 50% and 100% in addition to the presence of 5% cement replacement by weight with SF. The concrete cylinders have been tested after 28 days. The utilization of NP and SF has showed a noticeable influence on the mechanical properties of concrete. Therefore, based on the results, the replacement of 20% of fine aggregate and 5% of cement in concrete with NP and SF, respectively has increased the compressive and tensile strength of concrete.