**EFFECT OF HEATING ON SIMPLY SUPPORTED REINFORCED CONCRETE DEEP BEAMS**

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**ABSTRACT: -** This laboratory research is concerned with the behavior of reinforced concrete deep beams, being exposed to high temperatures for one time or more. Two types of mixing water are used, namely, drinkable water (tap water) and non-drinkable water (raw water) brought from local wells in Baquba city, a situation which is currently under use in Iraq especially in large urban and nonurban engineering facilities. The specialized high temperature furnace is manufactured used in this study to heat twenty-four specimens. Later on after deep beams are casted, specimens are cooled down by two ways, gradually, by leaving them in the air for one day, and the fast way by gently putting them in water. This is to reflect the case of fire extinguish process with integrity of concrete. Testing of beams is carried out by loading each beam, using flexural machine, with two concentrated loads till failure.

Test results show that using raw water in casting concrete (no heat exposure) leads to significant decrease in shear strength and an increase in deflection in comparison with using tap water. It is also observed that heat and then rapidly cooling causes a touchable strength decrease and deflection increase especially when raw water is used for concrete casting.

Finally, it is worth to mention that the lowest percent reduction in loading strength recorded is that for specimens cast with non-drinkable water and exposed to cyclic temperatures, with rapid cooling at each time.

**Keywords:** deep beam, heating, cyclic heating, way of cooling, raw water.