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## High performance concrete

In the Engineering industry, the improvement of existing materials allows for technological advancement and the construction of more reliable structures without over design. High Performance Concrete (HPC), a material widely utilized in heavy structural construction is a cheap and dependable material that can be studied to reach its optimum performance. This research is based on the measurement of early age characteristics of the High Performance Concrete (HPC), the study of the influence of water binder ratio and binder composition on setting, and the influence of strength, slump, and air content in the material. For the measurement of setting we have to use an instrument called the Mortar Penetrometer. With it we can measure the (psi) of the Mortar to see in how much time it sets. The process is done by changing the needle of the Mortar Penetrometer (1/2, 1/10, 1/20, 1/40) and the pressing down in the specimen as established in the ASTM C 403 Procedure. The water binder ratio was divided in three sets: .25, .30 & .40. I had six concrete mixes to do, that the numbers or formulas of how much of every material I had to use was already given by Patrick Earney a PhD student at Columbia, Missouri in the Civil Engineering department. By utilizing fly ash and silica fume within a 0.35 water binder ratio, the observation can be made that the high performance concrete is harder and more durable, even though it takes longer to set.