Civil Engineering III: A Study of Concrete Mix Designs

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The purpose was to determine how a concrete mix design of personal development (RG3) will perform against a certified mix of 3,600 PSI (Pounds per Square Inch) and how this new mix (RG3) will perform against previous personal work (RG2). The hypothesis was RG3 will measure a higher yield strength on average of 25 PSI on each break compared to the control, but have a weaker yield strength than RG2 on average of 25 PSI on each break. Data was collected on days 3, 7 and 28 of curing. Three cylinders of each mix were broken using a compression machine, following industry standard. On the first break, RG3 was 260 PSI weaker than the control and 400 PSI weaker than RG2. RG2 was stronger than the control with a PSI of 140; the rank of the mix designs stands RG2, Control, RG3. On the second break RG3 was 380 PSI weaker than the control and 440 PSI weaker than RG2. RG2 was 60 PSI stronger than the control; the rank remained the same. On day 28, RG3 was 670 PSI weaker than the control and 430 PSI weaker than RG2. RG2 was weaker than the control by 240 PSI; the rank was Control, RG2, RG3. The hypothesis was disproven. Theoretically, RG3 preformed inadequately due to the additive causing the mix to be too wet. To further this research, testing could be extended beyond the standard 28 days and the admixture changed to produce a dryer slump to improve the design.

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