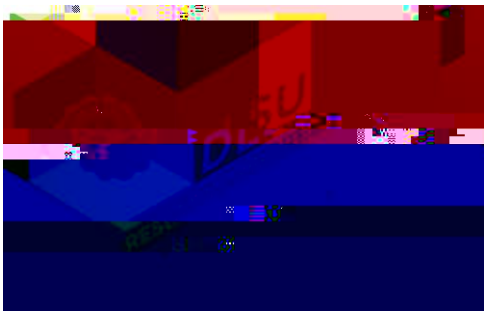

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Application of Response Surface Methodology: Optimum Mix Design of Concrete with Slag as Coarse Aggregate

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Abstract: The optimum mix design of slag in concrete is one of the best ways in identifying which mixture will yield high compressive strength without compromising good behavior and significance of each variable in every compressive strength test when a certain percentage of slag is being mixed in concrete. To determine the mix design that will yield the optimum compressive concrete strength, response surface methodology (RSM) is explorer in this study.

RSM is an optimization tool explored in the study because it interprets experimental results even in a non-linear response surface manner and it provides sufficient experimental interpretation as part of the conclusive result [1]. It has modern optimization features that can be useful in most complicated experimental design. Its most important applications are in the field where variables have potential significance in predicted system behavior called response. The combination of factorial application and modern experimental design has outstanding contribution in optimizing experimental procedures in a reduced number of studies and the response is easy to interpret.

RSM was used on the data obtained from laboratory experiments conducted by the researchers. The experiments conducted include the influencing factors: slag percentage (50%, 75%, and 100%), curing period (14 days, 21 days, and 28 days), and types of cement (1P, I, and IP), and the interaction effects of these factors in compressive strength test are analyzed in this paper through response surface methodology. The responses of each specimen have showed significant incre215(a2( )-9080-7(2 Tm( )-5(bt)5(ai)4(n1-2(av)-2(e)-5( )-46(s)