

**A STUDY ON THE INFLUENCE OF GGBS TO
CONCRETE WORKABILITY, STRENGTH AND
RESISTANCE TO CARBONATION WITH
APPLICATION TO AGGRESSIVE ENVIRONMENT**



**INSTITUTE OF RESEARCH, DEVELOPMENT
AND COMERCIALISATION
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR
MALAYSIA**

BY:

**GOH LYN DEE
CLOTILDA PETRUS
SYAHRUL FITRY SENIN**

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Surat Kami : 600-IRDC/ST 5/3/741

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Encik Mohd Ha'il Marsuki
Penolong Akauntan
Unit Kewangan Zon 17
UITM, SHAH ALAM

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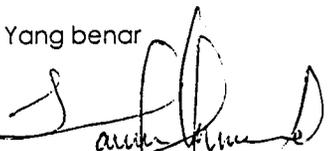
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Ketua Penyelidikan (Sains & Teknologi)
b/p Penolong Naib Canselor (Penyelidikan)

- s.k. i. Pengarah Kampus
UiTM Cawangan Pulau Pinang
- ii. Koordinator URDC
UiTM Cawangan Pulau Pinang
- iii. Penolong Bendahari
UiTM Cawangan Pulau Pinang
- iv. Pn. Goh Lyn Dee
Ketua Projek
UiTM Cawangan Pulau Pinang

/sam.

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ABSTRACT

The use of slag as partial cement replacement material offers benefits with respect to the cost of manufacturing of concrete, because this raw material is produced as by-products of steel production. The scope of this research is to study the effect of slag as cement replacement material for workability, strength development, compressive strength, depths of chloride ions penetration and carbonation into concrete. The study is based on the application to the Malaysia environment. From the results attained, it shows that the workability of concrete mixes added with slag at various percentage increases with the increase of percentage of slag added. For the strength development, the result shown that concrete added with slag will only achieve to its strength at later ages. The incorporation of slag up to 70% to partially replace Portland cement in concrete shows an increase in long-term compressive strength. Mixes containing more than 70% slag replacement shows a poor result in strength. It is also observed that by increasing the amount of slag in the mix resulted in a decrease of depth of chloride penetration into the concrete immersed in the artificial sea water but the carbonation depth is also increasing. However, it has to be noted that the study is only based on the short-term period. The influence of additions of slag into the concrete has been a subject of much interest of researchers as there are still some disagreements as to its effects. The reasons for much of this debate to be related to the test procedures and conditions used in the studies and to the basis on which comparisons have been made.