

CHAPTER 5

COMPUTER PROGRAMME OF MIX PROPORTIONS COMPUTING MULTIPLE BLENDED BINDERS CONCRETE

5.1 Introduction

In recent years, extensive research has been conducted which encompasses waste product as cement replacement material. Construction of today based on the concern for green building. These researches done focus on waste products such as RHA, SF, Metakolin, FA, WPSA as cement replacement material. However, this study mix with three types of waste materials that consist of MIRHA, SF and PFA with the difference percentage that the researcher has not done before results from the waste materials indicate strength that achieves exceeding normal concrete strength.

5.2 Development the computer program.

Industry user would be experience confusion in the use of waste material as cement replacement material if this mixed proposal is not explain or industry user is not aware. In order to facilitate the use of this waste through the computer program invented, assist the industry to choose the option. They are how many MIRHA entailment necessary in mixture, how to choose mixture type entailment and how to see quantity and the cost simultaneously through this computer program.

This computer program has been developed for industry friendly user. It helps to identify the volume mix proposal under blended binders using waste product dealing with strength. These programs developed by using table mix of multiple blended binders used MIRHA, SF and PFA based on their strength, surface hardness and durability.

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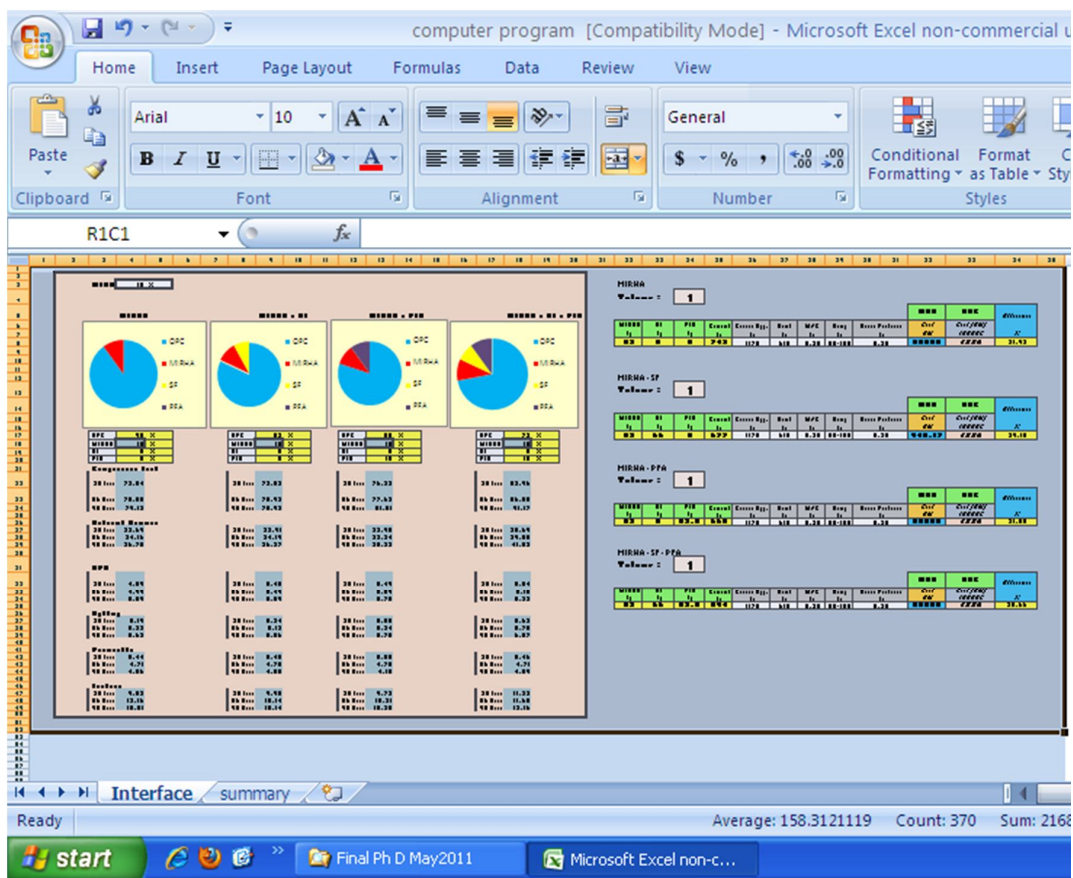


Plate 5.1: Table Mix Proportions of Multiple Blended Binde

5.2.1 To establish a table mix proportions of multiple blended binders concrete based on their strength.

The table mix proportion of multiple blended binders used MIRHA, PFA and SF and has been using Microsoft office excel program. The main objective these programs being designed using Microsoft office excel because it can be eliminated access in all system computer which uses Microsoft office. In this manner, industry can use this program directly without dealing any software to run this program.

The data was achieved from the test result in concrete engineering laboratory. Included in this computer program is by This program used the mathematical formula of bell curve to referring Bell Fuzzy Modeling proposal.

A generalized Bell Fuzzy Modeling is specified by three parameters {a, b, c}:

$$bell(x; a, b, c) = \frac{1}{1 + \left| \frac{x - c}{a} \right|^{2b}}$$

Where the parameter b is usually positive. Note that this Fuzzy Modeling is a direct generalization of the Cauchy distribution used in probability theory. Figure 5.1 illustrates a generalized bell Fuzzy Modeling defined by $bell(x; 20, 4, 50)$.

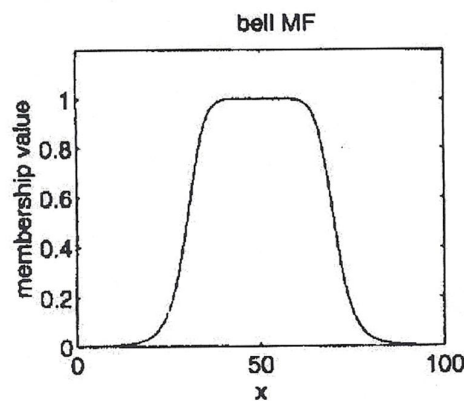


Figure 5.1: Fuzzy Modeling defined by $bell(x; 20, 4, 50)$

A desired generalized bell Fuzzy Modeling can be obtained by a proper selection of the parameter set {a, b, c}. Specifically, we can adjust *c* and *a* to vary the centre and width of the Fuzzy Modeling, and then use *b* to control the slope at the physical meanings of each parameter in a bell Fuzzy Modeling (Jyh-Shing Roger Jang,1995).

In this computer program, industry users are only required to insert percentage of MIRHA to get their on concrete mixes proposal due to target strength. When the MIRHA value has been typed in the box prepared such as in Plate 5.2, the industry user is only required to press “ENTER”, so instantly the industry user will get the value information regarding strength, surface hardness, permeability and velocity as per mixture proposed.

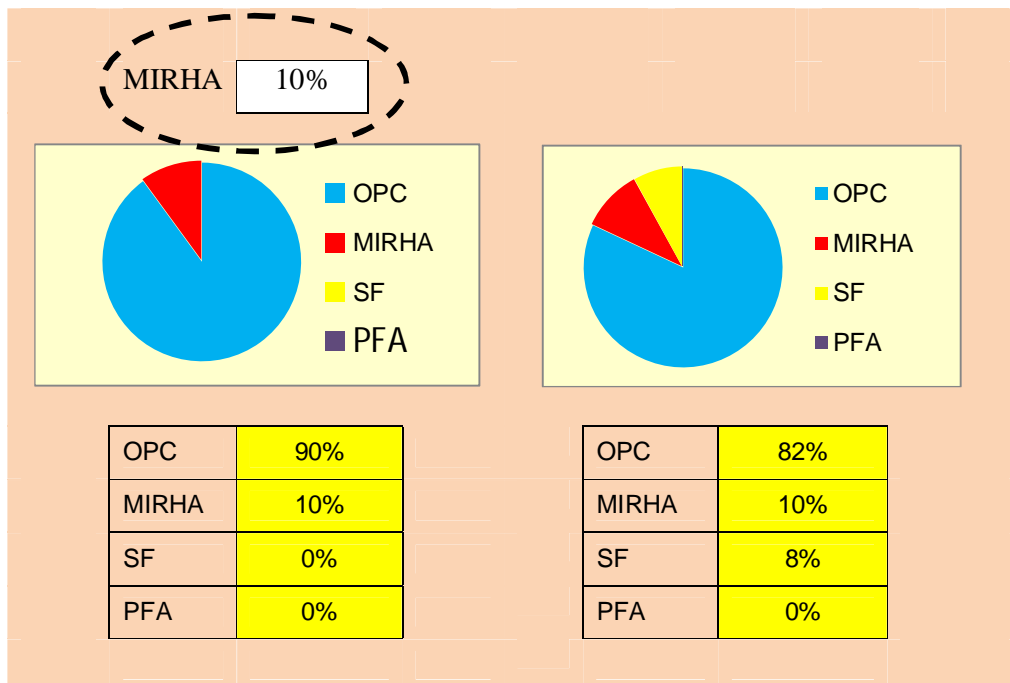


Plate 5.2: Table mix proportions of multiple blended binders – Insert MIRHA Percentage

Privilege in this computer program is the ability of the industry user to data of all types of mixes in multiple blended binders and blended binders by insert one value percentage needed for MIRHA. Not only percentage data in difference mixes provided appear but the value of strength, surface hardness, velocity and permeability also will be accessible, refer to Plate 5.3.

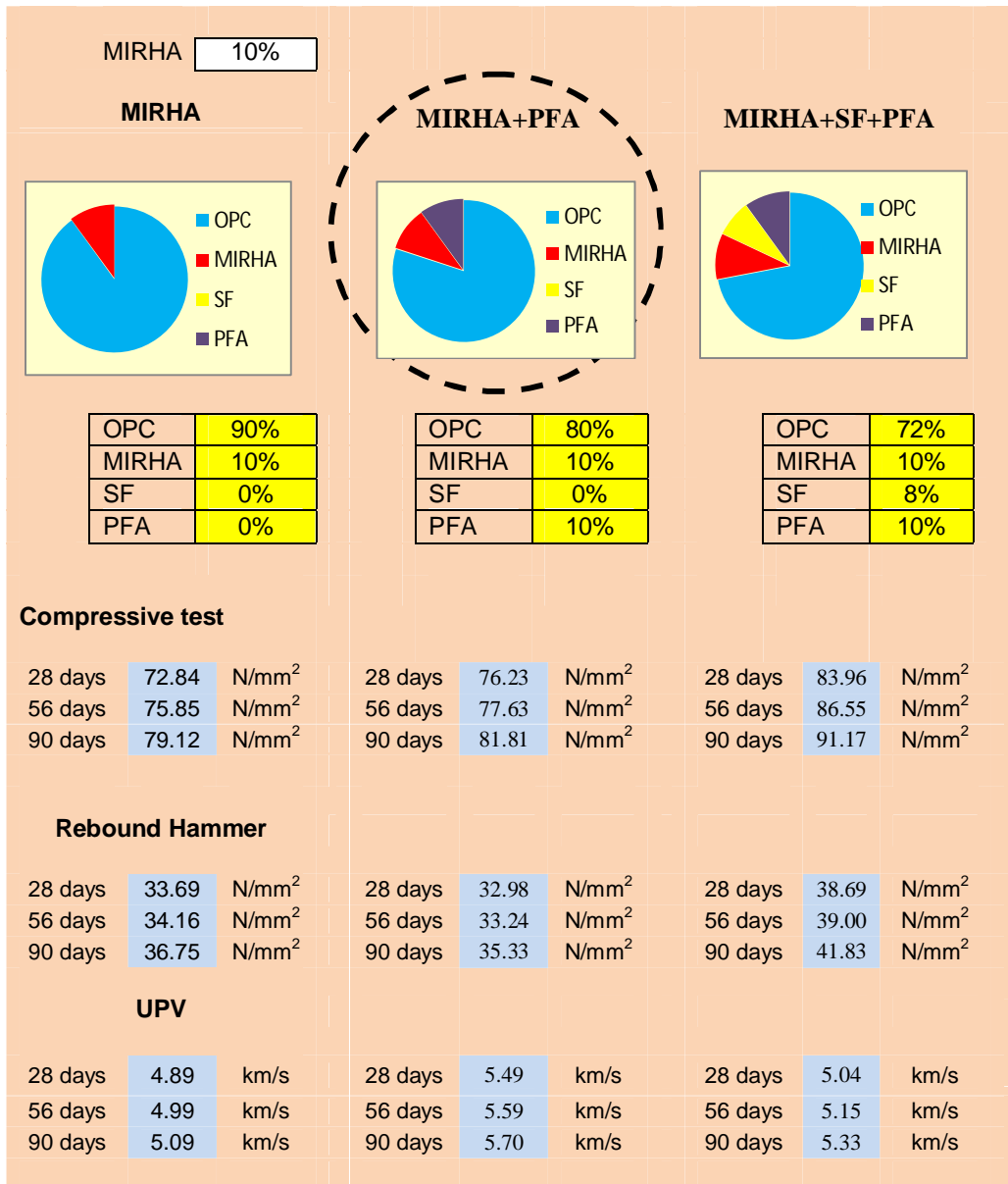


Plate 5.3: Table Mix Proportions of Multiple Blended Binders – DATA

Industry user can also select how many volume entailment to enable him to find out how much quantity to be mixed for every mixture material needed for OPC, MIRHA, SF and PFA. Not only information on material quantity is stated in this computer program, but the cost is also attached such as in Plate 5.4.

MIRHA + SF + PFA										MBB	HSC (without MIRHA)	Diff.
Volume :		1								Cost	Cost (RM)	
MIRHA	SF	PFA	OPC	Coarse Agg.	Sand	w/c	Slump	Super Plasticizer	RM	FOSROC	%	
kg	kg	kg	kg	kg	kg	ratio	mm	kg				
82.5	66	82.5	594	1170	610	0.35	50-100	8.25	945.95	1326	28.66	

Plate 5.4: Table Mix Proportions of Multiple Blended Binders – QUANTITY AND COST

Hence, with the existence of this computer program it will facilitate industry user especially independent contractor who can choose the type of mixture which one can satisfy based on the cost or the type of strength entailment.

In addition, ideally the information can be surfed easily using smart phone which today is being widely sold in the market. Ultimately, this computer program can really effect positively on group industry, researcher and the environmental authority.