MANUFACTURING OF PORTLAND CEMENT AND ITS ESTIMATION OF PRODUCTS

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Thesis submitted in partial fulfillment of the requirement for the Degree of Science (Hons.)

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Acknowledgements:

First of all, I would like to take this golden opportunity to express my almost appreciation and sincere gratitude to my supervisor; Dr. Mohd Misbahul Amin for his continuous guidance, advice, constructive comments throughout the course of this project.

In addition, I would also like to express my deepest gratitude to my personal advisor; Prof. Madya Dr. Ku Halim Ku Bulat for all his priceless advice, kind supervision, guidance and relentless patience in helping me for complete this project. Not forgetting also, to Puan Marinah Mohd Ariffin who's our final year project coordinator and all lecturers for their thought and advice, which have helped me in many-many ways.

Special thank to Mr. M.P Devandran, General Manager Operations; Mr. M.K.S Maniam Kuppusamy, Quality Control Manager and all members of Pahang Cement Sdn. Bhd. for their assistance, constructive comments, guidance and advice in this project. Thank you.

Besides, my thanks also go to Kak Hasbah and lab assistants namely En. Tarmizie, En. Ruzeman and all staft in UPM/KUT for all their kindness and cooperation in helping me. Not forgetting to all my housemates, my course mates and friends who helped me throughout my time have.

Last but not least, I wish to thank all of my family especially my parents for their support, care and concern. Thank you for everything. May God bless you all.

Abstract.

To prepare portland cement-OPC in laboratory (sample) by using chemical matter in order to view comparison between portland cement in the industry (cement). Portland cement contain 4 main basic matter that is 66 % of CaO, 21 % of SiO_2, 5.8 % Al_2O_3, 3.6 % Fe_2O_3 and 5 % gypsum which been added at the end of grinding process to regulate the setting time of concrete. A very high temperature is needed (1450°C) in producing 3 CaO. SiO_2, 2 CaO.SiO_2 , 3 CaO. Al_2O_3 and 4 CaO. Al_2O_3 Fe_2O_3 which were the main component in portland cement. However, in this study, the materials are only heated at temperature of 200°C for unavailable of furnace. Experimentally that been carried out are based on MS 522-Part 1:1989.

From the experimental that has been done, it is found that the value of specific gravity is different, in fact it is more delicate and lighter compare to the cement. This caused the experiment such as specific surface, setting time, soundness expansion and compressive strength for mortar and concrete cannot be carried out exactly.

Abstrak.

Menyediakan simen portland-OPC di dalam makmal (sampel) dengan menggunakan bahan-bahan kimia untuk melihat perbandingan dengan simen portland dalam indusrti (simen). Simen portland mengandungi 4 bahan asas utama iaitu 66 % CaO, 21 % SiO_2, 5.8 % Al_2O_3, 3.6 % Fe_2O_3 and 5 % gypsum yang ditambah pada peringkat akhir proses pengisaran untuk mengawal masa pengerasan konkrit. Suhu yang tinggi diperlukan (1450°C) untuk menghasilkan 3 CaO. SiO_2, 2 CaO.SiO_2 , 3 CaO. Al_2O_3 dan 4 CaO. Al_2O_3 Fe_2O_3 yang merupakan komponen utama dalam simen portland. Namun. Di dalam kajian ini, bahan-bahan ini hanya di panaskan pada suhu 200°C kerana ketiadaan relau. Pengujian yang dijalankan adalah berdasarkan MS522-Part 1:1989.

Daripada pengujian yang dibuat, didapati nilai spesifik graviti sampel adalah berbeza, malah ianya adalah lebih halus dan lebih ringan berbanding dengan simen. Ini menyebabkan pengujian seperti kehalusan, penentuan masa, pengembangan dan kekuatan bagi mortat dan konkrit tidak dapat dilakukan dengan tepat.