THE DURABILITY STUDY OF BLEND CEMENT USING SEWAGE SLUDGE ASH (SSA) AND EGGSHELL

LUKMAN SYARIF BIN ANDI LANTARA

Thesis submitted in fulfillment of the requirements
for the award of the
Bachelor Degree in Civil Engineering

Faculty of Civil Engineering and Earth Resources

UNIVERSITI MALAYSIA PAHANG

JUNE 2017

ABSTRAK

Dalam tahun-tahun kebelakangan lalu, sektor pembinaan Malaysia terus berkembang dengan itu secara langsung membawa kepada peningkatan permintaan bahan binaan termasuk simen. Peningkatan permintaan untuk bahan-bahan pembinaan telah dipanggil dengan cara alternatif untuk membangunkan atau memperoleh bahan binaan daripada sumber lain. serbuk kulit telur (ESP) dan gelombang mikro abu enapcemar kumbahan (MSSA) boleh dianggap sebagai pengganti simen separa alternatif dalam menghasilkan konkrit. Ia boleh mengurangkan kos bahan-bahan mentah dalam industri konkrit serta mengurangkan kesan ke atas pencemaran alam sekitar. Persembahan ketahanan konkrit yang mengandungi ESP dan MSSA diuji terhadap kakisan, serangan asid, rintangan sulfat dan penyerapan air dengan peratusan masa yang berbeza kulit telur dan berbeza pengawetan. Keputusan menunjukkan bahawa gelombang mikro abu enapcemar kumbahan (MSSA) dan serbuk kulit telur (ESP) adalah sesuai sebagai pengganti separa simen. Kadar rendah penyerapan air adalah SE15 konkrit iaitu 3.96%, kadar yang paling rendah kakisan juga SE15 konkrit iaitu 0.14% untuk serangan asid dan 0.04%

ABSTRACT

During past recent years, Malaysia's construction sector keep growing thus directly led to the increasing demand of construction material including cement. The increase in demand for the construction materials has called for an alternative way to develop or derive construction materials from other sources. Eggshell powder (ESP) and microwaved sewage sludge ash (MSSA) can be treated as alternative partial cement replacement in producing concrete. It may reduce the cost of the raw materials in concrete industry as well as minimize the effect on environmental pollution. The durability performances of concrete containing ESP and MSSA are tested against corrosion, acid attack, sulphate resistance and water absorption with different percentage of eggshell and different time of curing. The results show that microwaved sewage sludge ash (MSSA) and eggshell powder (ESP) are suitable as partial replacement to cement. The lowest rate of water absorption is concrete SE15 which is 3.96%, the lowest rate of corrosion also concrete SE15 which is 0.14% for acid attack and 0.04%