1 SURFACE TREATED RECYCLED CONCRETE AGGREGATE(RCA) AS GREEN CONSTRUCTION MATERIAL

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1.1 INTRODUCTION

Concrete has never been claimed as an environmentally friendly material because of its damaging nature resource consumption and severe environmental impact after used. Nevertheless, it will remain one of the major construction materials being utilized worldwide for the construction of infrastructures, houses and commercial buildings. By taking the concept of sustainable development into consideration, the concrete industry has to be implemented at various strategies with regards to future used of concrete, for instance the recycle used of aggregate. In general, aggregates occupy about 55% to 80% of concrete volume of the constructed buildings. Without any proper alternative of aggregates being utilized for the year future, the concrete industry globally will consume about 8 to 12 billion tons annually of natural aggregates after the year 2010 (Tu et al., 2006). The large consumption of natural aggregates from the quarry will affect the environment and reduce the natural resources.

Therefore, by seeking another alternative as replacement of natural aggregates is required as the green aggregates materials for the construction of infrastructures and buildings in Malaysia which known as Recycle Concrete Aggregate (RCA). Figure 1.1 shows the recycle aggregates which taken from different locations at sites such as demolishing buildings, renovations of houses and buildings, waste concrete from laboratories and dumping construction sites. Figure 1.2 shows the production of coarse RCA. These recycle aggregates can be reused again as aggregates in the constructions of house, buildings, highway, bridges, reservoirs, infrastructures and others. However, the recycle aggregates need to be cleaned and process to become as natural aggregates. This chapter explicitly explains and discusses the physical and mechanical properties of recycle aggregates such as workability, compressive strength, tensile strength, density, water absorption, porosity, chloride penetration, permeability, drying shrinkage and high performance concrete.

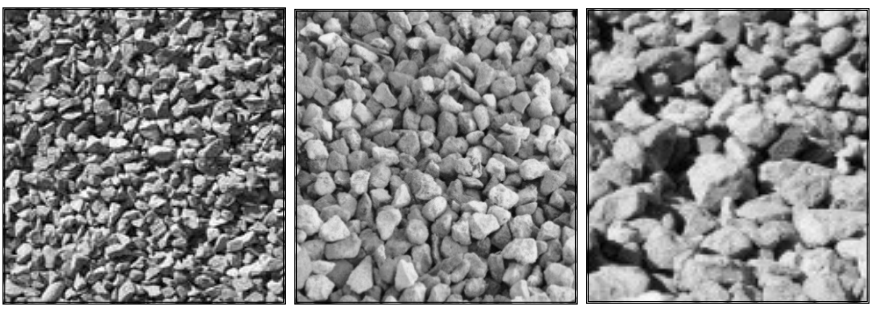

Figure 1.1. Three different types of recycle aggregates obtained from sites.